GALATASARAY UNIVERSITY
SOCIAL SCIENCES INSTITUTE
DEPARTMENT OF ECONOMICS

THE DEVELOPMENT AND CONSTRAINTS IN THE ORGANIC FOOD MARKET IN TURKEY

PH.D. THESIS

Nazife Merve HAMZAOĞLU

Thesis Supervisor: Bilge ÖZTÜRK GÖKTUNA

SEPTEMBER, 2018

ACKNOWLEDGEMENT

I am very grateful to my supervisor Assoc. Prof. Dr. Bilge Öztürk Göktuna for her continuous help, support, fruitful comments and constructive discussions that have greatly contributed to this thesis.

I am deeply grateful to my parents, Hülya Hamzaoğlu and H. İbrahim Hamzaoğlu and my sister Zeynep Durusu for their reliable support and constant faith in me.

TABLE OF CONTENTS

.

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

AB : Avrupa Birliği

ABD : Amerika Birleşik Devletleri

AFSIC : Alternative Farming Systems Information Center

AMS : Agricultural Marketing Service

AKS : Arıcılık Kayıt Sistemi

BC : Before Christ

CAP : Common Agricultural Policy

ÇKS : Çiftçi Kayıt Sistemi

COAG : Committee of Agriculture

CORE : Coordination of European Transnational Research in Organic Food and Farming Systems

DITSL : Deutsches Institut für tropische und subtropische Landwirtschaft GmbH

EIB : Ege İhracatçılar Birliği

ELO : European Land Owner Organization

EPRS : European Parliamentary Research Service

ERS : Economic Research Service

ETO : Ekolojik Tarim Organizasyonu

EU : European Union

EUMOFA : European Market Observatory for Fisheries and Aquaculture Products

FAO : Food and Agriculture Organization of United Nations

FIBL : Forschungsinstitut für Biologischen Landbau

FLO : Fair Trade Labelling Organization

FNAB : Fédération Nationale d'Agriculture Biologique

FSA : Farm Service Agency

FSC : Forest Stewardship Council

GAP : Good Agricultural Practices

GEKA : T.C. Güney Ege Kalkınma Ajansı

GDO : Genetiği Değiştirilmiş Organizma

GMO : Genetically Modified Organisms

IBS : International Basic Standards
ICCOA : International Competence Centre for Organic Agriculture
ICROFS : International Centre for Research in Organic Food Systems
ICS : Internal Control System
IFOAM : International Federation of Organic Agriculture Movement
IFPRI : International Food Policy Research Institute
ISOFAR : International Society of Organic Agriculture Research
KSKDER : Tarımsal Ürün Kontrol ve Sertifikasyon Kuruluşları Derneği
NGO : Non-Government Organization
NOP : The US Department of Agriculture National Organic Program
NOSB : National Organic Standards Boards
NPO : Non Profitable Organization
OCA : Organic Consumer Association
OECD : Organization for Economic Cooperation and Development
OGM : Organisme Génétiquement Modifié
OMS : Organisation Mondiale de la Santé
ONG : Organisation Non Gouvernementale
ORCA : Organic Research Centre Alliance
ORGÜDER : Organik Ürün Üreticileri ve Sanayicileri Derneği
OTA : Organic Trade Association
OTBIS : Organik Tarım Bilgi Sistemi
PAN : Pesticide Action Network
SEAE : Spanish Society for Organic Farming and Agroecology
STK : Sivil Toplum Kuruluşları
SÖL : Stiftung Ökologie und Landbau
TAGEM : Tarımsal Araştırmalar ve Projeler Genel Müdürlüğü
TRACES : Trade Control and Expert System
TRT : Türkiye Radyo ve Televizyon Kurumu
TURKSTAT : Turkish Statistical Institute
TÜBITAK : Türkiye Bilimsel ve Teknolojik Araştırmalar Kurumu
TUİK : Türkiye İstatistik Kurumu
TÜRKVET : Veteriner Bilgi Sistemi
UAE : United Arab Emirates
UE : Union Européen
UN : United Nations
UNFCCC : United Nations Framework Convention on Climate Change

US : United States
USD : United States Dollar
USDA : United States Department of Agriculture
VIF : Variance Inflation Factor
WHO : World Health Organization
WFP : World Food Program
WTP : Willingness to Pay

RESUME

La ‘Révolution Verte’ qui définit des améliorations technologiques dans l'agriculture a dominé le système agricole après la Seconde Guerre mondiale. Se référant à ses améliorations dans l’agriculture conventionnelle moderne en termes de technologie, de disponibilité de nourriture, d’emploi dans les zones rurales, il y a plusieurs critiques qui ont également été exprimées à propos des externalités négatives sur la santé publique, l'environnement, la biodiversité et tous les systèmes écologiques de la planète. Des systèmes alternatifs du système conventionnel ont été recherchés pour résoudre des problèmes tels que la pollution de l'environnement, la réduction et la dégradation des espèces de semences domestiques, l'érosion des sols, la réduction du bien-être animal et les effets négatifs sur les OGM des cultures et aliments pour animaux. Cette thèse vise à étudier l’agriculture biologique et le marché alimentaire, l’un des systèmes alternatifs les plus importants à l’agriculture conventionnelle.

Depuis 1970, l'agriculture biologique est devenue un mouvement émergeant dans l'agriculture. Plusieurs organisations internationales ont été créées afin d'étendre la pratique de l'agriculture biologique dans le monde entier et de nombreuses normes internationales ont été élaborées pour garantir le processus de production biologique. À partir des années 1990, de nombreux pays développés, les États-Unis et les États membres de l'UE, avaient mis en place des normes biologiques afin de réglementer, soutenir et maintenir un système d'agriculture biologique plus dynamique et efficace. Aujourd'hui, l'agriculture biologique est mise en œuvre dans 178 pays et 87 pays ont leurs propres normes officielles.

L'objectif de cette thèse est de se pencher sur l'agriculture biologique et le marché alimentaire mondial et en Turquie. L'agriculture biologique était un marché niche dans le monde mais elle est devenue un secteur dominant avec un volume de ventes de 80 milliards USD dans le monde. On constate une augmentation considérable des terres agricoles biologiques, des producteurs, de la consommation par personne, des ventes et de la quantité de production. La gamme et la variété des produits alimentaires biologiques ont augmenté, plusieurs grands détaillants ont ouvert des sections d’aliments biologiques et la majorité d’entre eux ont commercialisé leurs propres marques biologiques. La croissance à deux chiffres du secteur promet une forte croissance dans le futur.

L'agriculture biologique et le marché alimentaire en Turquie ont un fort potentiel de développement. La Turquie est un important producteur d'intrants agricoles; le pays dispose de terres appropriées pour les activités agricoles biologiques, car ils sont exposés à des intrants artificiels dans une moindre mesure par rapport aux pays

développés. L'agriculture biologique a commencé comme une initiative des sociétés étrangères en Turquie en 1984 et a été appliquée pour la première fois dans le cadre de l'agriculture contractuelle. En 1994, la législation sur l'agriculture biologique a été appliquée pour la première fois et la Turquie a mis en vigueur sa première loi sur l'agriculture biologique en 2004. Le marché des aliments biologiques est en croissance depuis 2000 dans les grandes chaînes de distribution et les nouvelles marques ont participé au marché. La réglementation a été mise à jour et fournit un soutien gouvernemental dans une plus large mesure en termes des crédits d'investissement, des paiements à la surface, des réductions de taux d'intérêt, de l'aide à la publicité. Cependant, la demande de produits alimentaires biologiques est encore limitée et l'offre est principalement axée sur les exportations. IFOAM (2012) indique que 75% de la production biologique en Turquie est exportée. En outre, la production, la consommation par personne et le volume des ventes des produits alimentaires biologiques sont plus restreints que les pays développés en Turquie.

Les chercheurs et les activistes environnementaux ont commencé à se concentrer sur l'agriculture biologique car ses disciplines reposent sur un cycle durable dans l'environnement, ce qui conduit à des améliorations de la fertilité des sols, du bien-être animal, de la biodiversité et de la santé humaine. À partir des années 1980, le consumérisme vert a été un mouvement important dans le cadre de l'environnementalisme (Allen et Kovach, 2000), les consommateurs ayant commencé à rechercher des aliments produits respectueux de l'environnement. De plus, les maladies liées à l'alimentation amènent les consommateurs à s'interroger sur la sécurité sanitaire des aliments et sur le contenu des produits alimentaires conventionnels. L'OMS (2017a) indique que des produits alimentaires dangereux peuvent causer près de 200 types de maladies, car ils contiennent des bactéries nocives, des substances chimiques, des virus et des parasites. Cependant, l'utilisation d'hormones et d'antibiotiques dans l'élevage conventionnel pose divers problèmes de santé et de nutrition, entraînant la formation de bactéries résistantes aux antibiotiques. Les produits alimentaires biologiques sont positivement liés à la santé humaine car ils sont produits conformément à des normes biologiques garantissant des conditions spécifiques et générales, notamment l'absence d'intrants artificiels, le bien-être des animaux et le processus de production contrôlé. L'utilisation d'antibiotiques et d'hormones dans l'élevage d'animaux biologiques est interdite et l'utilisation de méthodes homéopathiques contre les maladies sont essentiel. En ce qui concerne les préoccupations relatives à l'environnement et à la santé, les consommateurs sont plus susceptibles de consommer des produits alimentaires biologiques aujourd'hui.

Il y a quelques problèmes dans le développement de l'agriculture biologique et du marché alimentaire, et le sujet de thèse couvre également ces questions. Comme la production biologique repose sur la normalisation, son processus de production est coûteux. Certifications, processus de transition en attente, les coûts d'analyse font partie de ces coûts. Les produits biologiques ont généralement un prix plus élevé par rapport à leurs homologues conventionnels. Outre les prix élevés, les études menées sur cette question débattent également de la méfiance des consommateurs et des actions frauduleuses sur le marché. Étant donné que la production biologique a plus d'avantages en termes d'environnement, de santé, d'écosystèmes et de bien-être, il est important d'examiner les contraintes qui empêchent la croissance et l'expansion de ce secteur.

Le but de l'étude est d'analyser les aspects de l'offre et de la demande de l'agriculture biologique et du marché alimentaire en Turquie et de modéliser l'impact de l'étiquetage erroné des produits biologiques sur le bien-être selon une approche théorique du jeu. Dans l'étude, l'agriculture biologique et le marché alimentaire ont été examinés en détail, les profils des consommateurs et des producteurs biologiques ont été décrits et le problème de l'étiquetage incorrect a été discuté.

Dans le chapitre 1, un aperçu de l'agriculture biologique et du marché alimentaire et une analyse comparative sont présentés. Le chapitre est plus vaste car il vise à donner une compréhension objective de l'agriculture biologique et du marché alimentaire dans le monde et en Turquie. Afin d'examiner le secteur sous plusieurs aspects, le chapitre 1 discute la définition, les principes, l'histoire, les bénéfices et les avantages, les critiques, les relations avec la durabilité, le système de production biologique dans le cadre de l'offre alimentaire biologique, la chaîne de l'offre, les obstacles et les barrières à l'entrée premièrement. L'agriculture biologique est devenue un système de production durable qui peut constituer une alternative plus saine et plus respectueuse de l'environnement à l'agriculture et au système de production conventionnel. Les principes de l'agriculture biologique se concentrent principalement sur l'amélioration de l'écosystème, la biodiversité, le bien-être animal, la santé publique, la préservation des sols, un système plus durable dans la production alimentaire. Aucun OGM et synthétisé artificiellement n'est inclus dans la production biologique. En outre, le chapitre examine les critiques et les désavantages de l'agriculture biologique en termes de développement du secteur des entreprises, avec des impacts négatifs tels que la contamination bactérienne et le kilométrage plus long. Les processus de production biologique, les canaux de distribution sont également discutés. Étant donné que le marché des aliments biologiques a été un marché grand public, de plus en plus de détaillants et d'intermédiaires ont été inclus dans le circuit de distribution. Le chapitre donne un aperçu des contraintes du côté de l'offre et des motivations et obstacles à la demande d'aliments biologiques. Ces questions sont mises et analysées plus en détail dans les chapitres 2 et 3.

En ce qui concerne l'information sur l'agriculture biologique et le marché alimentaire en général, une analyse comparative a été réalisée : agriculture biologique, élevage, aquaculture et apiculture, politiques agricoles biologiques et impact des institutions et des ONG sur l'agriculture biologique et les marchés alimentaires. Tout d'abord, ces sections traitent d'un problème mondial, et nous analysons plus tard les États-Unis, l'UE et la Turquie. Comme les États-Unis et l'UE sont les deux plus grands marchés d'aliments biologiques au monde et des marchés d'importation importants de produits alimentaires biologiques en provenance de Turquie, le chapitre donne des informations détaillées sur les statistiques et les politiques sur l'agriculture biologiques de ces pays. À mesure que l'étude se concentre sur la Turquie, les statistiques turques sur le marché des aliments biologiques et la politique sur l'agriculture biologiques sont expliquées en détail.

On constate que les États-Unis et l'UE sont des pays proéminents, tandis que la Turquie reste derrière de nombreux pays développés en termes de production biologique, de consommation par habitant et de ventes au détail. Étant donné que la Turquie possède des terres adaptées à l'agriculture biologique, plusieurs améliorations sont nécessaires pour le développement du marché. Des principes et des règles

similaires ont été adoptés dans les pays examinés. Il y a un nombre important de producteurs biologiques en Turquie. On voit qu'il y a une forte volatilité du côté de l'offre en termes de zones d'agriculture biologique, de quantité de production et de production de bétail en Turquie. De plus, certains segments de production importants, comme l'aquaculture biologique, n'ont pas encore été développés. De plus, on a vu qu'il y a des volatilités dans le nombre de producteurs spécialisés sur l'agriculture biologique qui ont bénéficié des aides gouvernementales. En ce qui concerne les politiques relatives à l'agriculture biologique et aux standards biologiques, nous constatons qu'il en existe deux types : les normes nationales et les normes des organisations internationales telles que IFOAM et Demeter. On constate que les standards établis par les organisations internationales sont plus stricts que les standards nationaux. Bien que nous examinions les politiques agricoles biologiques aux États-Unis, en UE et en Turquie, on constate qu'elles sont généralement similaires, alors qu'elles présentent de légères différences en termes de méthodologie approuvée, de substances autorisées et de classifications d'étiquetage. Il convient de noter que la loi turque sur l'agriculture biologique a été désignée conformément à l'UE. Depuis que l'UE se prépare à une nouvelle législation, la Turquie devrait également adopter des ajustements dans la législation actuelle sur l'agriculture biologique. En outre, l'UE étant un important marché d'exportation pour la Turquie, la Turquie doit procéder à des ajustements pour pouvoir être classée dans la liste des pays tiers de l'UE autorisant les options d'exportation des entreprises biologiques turques vers les pays membres de l'UE. Il existe plusieurs institutions et ONG fournissant des informations, des connaissances techniques, des discussions, des statistiques, des publications, des conférences, des réunions dans le monde entier. Aux États-Unis et dans l'UE, plusieurs instituts sont liés à des universités menant des recherches scientifiques et d'autres ONG encouragent des subventions pour les producteurs biologiques. En Turquie, il existe des instituts dans les universités et les ONG travaillent principalement dans le domaine de l'information pour les consommateurs, de l'organisation des marchés et des bazars biologiques et de la collecte des producteurs. Tant la demande que l'offre de produits agricoles biologiques et alimentaires en Turquie n'ont pas atteint un niveau satisfaisant et restent inférieures à celles des pays développés. Pour ces raisons, la thèse se concentre sur la compréhension et la recherche de solutions aux contraintes et aux obstacles de ce problème.

Après avoir examiné l'agriculture biologique et le marché alimentaire dans le monde et en Turquie, au deuxième chapitre, l'étude se concentre sur la demande alimentaire en produits biologiques en Turquie. La documentation existante indique que la demande d'aliments biologiques est faible sur le marché national en Turquie. Dans ce chapitre, les domaines d'étude comprennent les caractéristiques sociodémographiques, les préférences alimentaires, la fréquence et les caractéristiques des achats alimentaires, les préoccupations en termes de santé, la fréquence de faire des activités sportifs l'état de fumer, les préoccupations en termes d'environnement, les attitudes et comportements vis-à-vis des produits alimentaires biologiques, la volonté de payer pour les produits biologiques, le degré d'information sur les logos des produits biologiques, confiance en ces logos, confiance en certification biologiques, facteurs qui motivent la consommation d'aliments biologiques et obstacles à la consommation, discernement des produits alimentaires biologiques à acheter, , les médias pour suivre les publicités alimentaires et confiance en publicités alimentaires. Des études antérieures suggèrent que la demande d'aliments biologiques est concentrée dans les zones urbaines en Turquie. De plus, les données sur le prix et

la consommation biologiques manquent en Turquie. Pour cette raison, une enquête de consommateur est conçue et menée auprès de 750 consommateurs vivant dans les trois métropoles de Turquie qui sont Istanbul, Ankara et Izmir. Ce chapitre présente deux modèles économétriques différents. Dans le premier modèle économétrique qui estime la probabilité d'être un consommateur d'aliments biologiques, la régression logistique binaire est appliquée comme la variable dépendante est de consommer des aliments biologiques ou pas. Les résultats montrent que les consommateurs des alimentaires biologique en Turquie sont souvent des adultes, mariés, ont un revenu plus élevé, font des activités physiques, et surtout sont principalement préoccupés par les problèmes de la sante que ceux de l'environnement et des préférences alimentaires ; ils ont une connaissance limitée de la matière biologique. Le niveau de revenu a un effet important sur la consommation des aliments biologiques. On a trouvé que la nutrition a un effet négatif et significative et le gout délicieux des aliments biologiques a un effet positive et significative. Le deuxième modèle économétrique divise les consommateurs d'aliments biologiques en segments basés sur les prix de réservation pour les produits alimentaires biologiques et on a appliqué. Un graphique a été obtenu pour la demande d'aliments biologiques en Turquie en utilisant les prix de réservation relatifs déclarés par les participants. Notre figure est divisée en deux segments ; une partie du graphique est plus raide que l'autre. Pour un groupe de consommateurs, la consommation de ces produits est un besoin et pour l'autre groupe une demande pour une variété. Les produits alimentaires biologiques sont comme des produits de luxe pour ce groupe.

Dans le troisième chapitre, on analyse l'offre des produits alimentaires biologique en Turquie. On présente les producteurs d'aliments biologiques en Turquie et examine les contraintes et les barrières à l'entrée dans le secteur. Une enquête de producteurs est conçue et menée auprès de 250 producteurs des produits alimentaires en Turquie. En termes de la sélection de l'échantillon, les producteurs qui sont les membres des chambres de commerce and d'industrie sont choisis comme l'accessibilité de ces producteurs était plus possible. Dans les modèles économétriques, la régression logistique binaire est appliquée. Dans la première partie, l'étude révèle le profil des producteurs d'aliments biologiques en termes de taille d'entreprise, d'incitations publiques, de sensibilisation à l'environnement, de syndication et de niveau de formation des travailleurs, des barrières à l'entrée dans le secteur. Les résultats montrent que les producteurs des alimentaires biologiques sont conscients de l'environnement, principalement des entreprises de taille moyenne et syndiqués. En outre, ces producteurs considèrent que les coûts de transport et de certification sur le marché des aliments biologiques et la présence de produits importés constituent des contraintes importantes, tandis que les producteurs d'aliments conventionnels considèrent le manque de sensibilisation au terme biologique comme un problème important pour le développement de ce secteur en Turquie. Les résultats montrent que la conscience environnementale est une caractéristique importante pour les producteurs biologiques. On constate qu'il existe une différence entre les producteurs des aliments biologiques et ceux des aliments conventionnels en termes de la conception des difficultés et des obstacles dans le secteur. D'autres modèles économétriques ont été appliqués et ces modèles examinent les producteurs d'aliments biologiques en termes d'année d'entrée dans le secteur, de tailles de l'entreprise et de matières premières ou de produits biologiques transformés. L'année d'entrée est prise comme 2004 qui est l'année de l'entrée en vigueur de la loi sur l'agriculture biologique. Selon les résultats, il existe des différences entre les producteurs d'aliments

biologiques en termes de canaux publicitaires, d'attitudes vis-à-vis des restrictions sur le marché, de sensibilisation à l'environnement, d'affiliation syndicale et d'éducation et de formation des employés. Les données d'enquête montrent également que la plupart des producteurs de l'échantillon n'utilisent pas de subventions publiques dans l'agriculture biologique et ne connaissent pas tous les problèmes du secteur.

Dans le quatrième chapitre, on construit un modèle mathématique pour étudier le problème d'asymétries d'information dans le secteur de produits biologiques. On examine les consommateurs des alimentaires biologiques entend de niveaux d'information sur les produits alimentaires biologiques et préoccupations sur des questions telles que la santé et l'environnement. En outre, on analyse le problème de l'étiquetage erroné dans le secteur des aliments biologiques, ce qui entraîne un problème asymétrique d'information du côté de l'offre. On modélise l'impact de l'étiquetage erroné sur la croissance du secteur et sur le bien-être total. L'information asymétrique crée une externalité négative sur le marché. La manque d'information des consommateurs ne profite que les producteurs qui ont allé à moral. Les prix ne sont pas affectés par les paramètres liés à la manque d'information et à l'étiquetage erroné. Le prix du marché des aliments biologiques reste donc faible et peut même rester inférieur à un niveau suffisant pour l'entrée sur le marché. La manque d'informations du côté des consommateurs et l'aléa moral qui en résulte du côté des producteurs diminuent le bien-être sur le marché. Les politiques visant soit à éduquer les consommateurs sur la production biologique et l'étiquetage, soit à contrôler le marché peuvent certainement améliorer le bien-être.

Dans le cinquième chapitre, les résultats obtenus dans l'étude de thèse, des solutions et des propositions de politique appropriées sont soulignées. La partie de l'étude sur la demande donne une discussion détaillée de différents angles et un profil sur les consommateurs alimentaires biologiques en Turquie. L'étude offre des résultats plus complets, y compris les préférences alimentaires, l'état de santé et la sensibilisation à l'environnement, que le cadre d'études antérieures. En outre en catégorisant les consommateurs d'aliments biologiques par rapport à leurs prix de réservations, nous obtenons des conclusions importantes pour une étude plus approfondie dans ce domaine. Les résultats révèlent que le consommateur attache plus d'importance aux problèmes de sante qu'aux problèmes environnementaux. Le revenu a une forte influence sur la consommation d'aliments biologiques. Le fait que le consommateur n'a pas d'information complète est une barrière importante en termes de développement de la demande. Par conséquent, des politiques susceptibles d'accroître la connaissance du consommateur peuvent être utiles.

L'étude sur l'offre des produits alimentaires biologiques a le potentiel d'être une ressource importante en termes de décideurs, d'entreprises cherchant à entrer dans le secteur ou de sociétés concurrentes dans le secteur. Il y a eu diverses restrictions pour atteindre les producteurs dans l'étude de l'offre en aliments biologiques. La plupart des producteurs étaient réticents à répondre aux questions concernant des questions financières. De plus, afin de voir les effets de supports de gouvernement, on a demandé des questions sur ce sujet aux producteurs de l'agriculture biologique. Mais il est apparu que la plupart des producteurs dans l'échantillon ne reçoivent pas le soutien du gouvernement. Pour cette raison, cette partie de l'étude a été réalisé en se concentrant sur les sujets de l'environnement, du niveau d'éducation, de syndication, des problèmes

et des barrières à l'entrée dans l'industrie. Les producteurs d'aliments biologiques ont été examinés sous différents angles et les caractéristiques des producteurs biologiques qui pourraient servir de guide aux décideurs politiques ont été présentées. Cette analyse peut aider les autorités à mettre en place les incitations et les politiques nécessaires.

Le modèle mathématique du chapitre 4 montre clairement l'effet de produits mal étiquetés sur le marché des aliments biologique. Ce modèle suppose que les consommateurs des aliments biologiques sont hétérogènes. Les résultats montrent que les asymétries d'information peuvent être résolues avec un système plus contrôlé dans la production d'aliments biologiques. Les politiques pour augmenter le niveau d'information des consommateurs et pour accroître la confiance en produits d'aliments biologique peuvent aider à la croissance de la demande d'aliments biologiques. De plus, une politique de l'agriculture biologique plus concrète et durable qui comprend le soutien de gouvernement continu peut améliorer l'approvisionnement en aliments biologiques en Turquie.

Pour conclure, cette thèse étudie les aspects de la demande et de l’offre du marché des aliments biologiques en Turquie et examine le problème d’asymétries d'information sur le marché en utilisant un modèle mathématique. En ce qui concerne les résultats obtenus, la thèse peut être utile pour formuler plusieurs suggestions politiques en termes d'éducation, de diffusion, d'audit et de soutien financier, infrastructurel et institutionnel aux producteur.

ABSTRACT

Green Revolution which defines technological improvements in agriculture has dominated agricultural system after the second world war globally. Referring to its enhancements in modern conventional agriculture in terms of technology, availability of food, employment in rural areas; there have also been several critics about its negative externalities on the issues like public health, environment, biodiversity and all ecological systems on the planet. Alternative systems have been sought in order to address problems caused by conventional agriculture such as environmental pollution, reduction and damage of domestic seed species, soil erosion, reduction of animal welfare, and negative impacts of GMOs. The thesis aims to investigate the organic agriculture and food market which is one of the most prominent alternative systems for conventional agriculture.

Since 1970s, organic agriculture has become an emerging movement in agriculture. Several international organizations were established in order to expand the organic agricultural practice worldwide and many international organizations have formed standards to secure organic production process. From 1990s, many developed countries including US, EU member states, Canada had implemented organic standards in order to regulate, sustain and maintain a more dynamic and efficient organic agriculture system. There are 178 countries that have organic agricultural practices worldwide and 87 of them have their own national standards.

The aim of the thesis is to look into organic agriculture and food market worldwide and in Turkey. Organic agriculture had been a niche market in the world but it has become a mainstream sector with more than 80 Billion USD of sales volume globally. It is seen that there are tremendous increases in terms of organic agricultural lands, producers, per capita consumption, retail sales, and quantity of production. The range and variety of organic food products have risen, several big retailers have opened organic food sections and the majority of them have been marketing their own organic labels. Double digit growth of the sector promises a high growth in the future.

Organic agriculture and food market in Turkey has a high potential to develop. Turkey has suitable lands for organic agricultural activities as they are exposed to artificial inputs at a lesser extent in comparison with developed countries. Organic agriculture has begun as foreign companies' initiative in Turkey in 1984 and it was firstly applied as a part of contractual agriculture. In 1994, the organic farming legislation was implemented and Turkey put into force its first organic farming law in 2004. The organic food market has been growing since 2000s in the country, a wider product range is available at bigger retail chains; newer brands have taken part at

stores. The regulation has been updated and provides government supports in terms of loans, area payments, reduced interest rates, government broadcasting at a larger extent. However, the demand for organic food products is still limited and the supply is mostly export oriented. IFOAM (2012) states that 75% of organic production in Turkey are exported. Besides, organic farm lands production, per capita consumption, and retail sales are lower in comparison with developed countries in Turkey.

Researchers and environmental activists have started to concentrate on organic agriculture as its disciplines relied on sustainable cycle in the environment which leads to enhancements in soil fertility, animal welfare, biodiversity, human health. From 1980s, green consumerism has been an important movement as a part of environmentalism (Allen and Kovach, 2000) as consumers have started to look for more environmental friendly food. Moreover, food related diseases lead consumers to question food safety and the content of conventional food products. WHO (2017a) expresses that unsafe food products may cause almost 200 types of illness as they contain harmful bacteria, chemical substances, viruses, parasites. In addition, the use of hormones and antibiotics in conventional livestock production may lead to serious health problems and antibiotic-resistant bacteria. Organic food products are positively related to human health as they are produced in accordance with organic standards that guarantee general specific conditions including the absence of artificial inputs, animal welfare, monitored production process. To cure the diseases, the use of antibiotics and hormones is forbidden in organic livestock production and homeopathic methods are essential. Regarding the concerns on environment and health, consumers are more likely to consume organic food products today.

Since organic production is based on standardizing, it has a costly production process. Organic products have generally price premium in comparison with their conventional counterparts. Certification, the length of conversion period and land analysis are some of the main additional costs in organic production. Apart from high prices, studies conducted on this issue also discuss consumer mistrust and fraudulent actions in the market. Since organic production has more benefits in terms of environment, health, ecosystems and welfare, it is important to look into the constraints that prevent the growth and expansion of this sector.

The scope of the study is to analyze the demand and supply sides of organic food market in Turkey separately and model the impact of mislabeling of organic on welfare using a game theoretical approach. The thesis provides with a profiling of organic consumers and producers, examines constraints that cause obstacles to the growth of organic agriculture and food market in Turkey and models the impact of mislabeling on total welfare.

In Chapter 1, an overview of organic agriculture and food market and a comparative analysis is made. The chapter has a broader focus as it aims to give an objective understanding on organic agriculture and food market in the world and in Turkey. In order to examine the sector from several aspects, Chapter 1 discusses the definition, principles, history, benefits and advantages, critics and disadvantages, relation with sustainability, organic food production process, supply chain at the first place. Organic agriculture has formed as a sustainable production system which may

be a healthier and more environmental friendly alternative to conventional agriculture and production system. Its principles mainly concentrate on enhancing the ecosystem, biodiversity, animal welfare, public health, soil preservation, a more sustainable system in food production. No GMOs and artificially produced synthetizes are included in organic production. Moreover, the chapter examines critics and disadvantages of organic agriculture in terms of becoming a more corporate sector, having some negative impacts such as bacterial contamination, and longer mileage. Organic production process, distribution channels are also discussed. Since organic food market has been a mainstream market, more retailers and intermediaries have being included in the distribution channel. The chapter gives an outlook to constraints in the supply side and motives and barriers for the organic food demand. These issues are discussed and analyzed in more detail in Chapter 2 and 3.

Regarding the information on organic agriculture and food market in general, a comparative analysis has been made including an overlook to organic agriculture, livestock production, aquaculture and beekeeping, organic agricultural policies and impact of institutions and NGOs on organic agriculture and food market. Firstly, these sections discuss a worldwide overlook, thus we analyze US, EU and Turkey later on. As US and EU are the two largest organic food markets in the world and important exporters of organic food products from Turkey, the chapter gives detailed information on statistics, organic agricultural policies, impacts of institutions and NGOs on organic food market in the world and these countries. As the scope of the study concentrates on Turkey, Turkish statistics on organic food market, organic policy are also explained in detail.

It is seen that US and EU are forthcoming leaders in the organic food market, whilst Turkey remains behind many developed countries in terms of organic production, per capita consumption, retail sales. Since Turkey has suitable lands for organic agriculture, there are several improvements required for the development of the market. In Turkey the number of organic producers is at a significant level. We see that there are high volatilities in the supply side in terms of organic agriculture areas, production amount, livestock production in Turkey. Also, some important production segments like aquaculture have not been developed yet. Furthermore, we have seen that there are volatilities in numbers of producers who have benefited from government supports. In terms of policies on organic agriculture and organic standards, we see that there are two types: national government standards and standards of international organizations such as IFOAM and Demeter. It is seen that standards made by international organizations are more stringent than national standards. While we look into organic agricultural policies in US, EU and Turkey, it is seen that they are generally similar while they have small differences in terms of approved methodology, allowed substances, labeling classifications. It is noteworthy to say that Turkish organic farming act was designated in compliance with EU. Since EU has been preparing for a new legislation, Turkey should adopt adjustments in the current organic agriculture legislation as well. Moreover, as EU is an important export market for Turkey, Turkey needs to make adjustments in order to be classified in the EU third countries list which allows Turkish organic firms export options to EU member countries. There are several institutions and NGOs providing information, technical knowledge, discussion fora, statistics, publications, conferences, meetings in worldwide. In US and EU, there are several institutes that are linked to universities conducting scientific research and some NGOs promoting grants for organic

producers. In Turkey there are institutes at universities, and NGOs mostly function on consumer information, organization of organic bazaars and markets, and gathering producers. Overall, we see that both demand and supply of organic agriculture and food market in Turkey has not reached to a satisfactory level and remain behind those of developed countries. For these reasons, the thesis focuses on understanding the problems and suggesting solutions to the constraints, barriers in the sector.

After an overview of the organic agriculture and food market in the world and Turkey, the study focuses on Turkish organic food demand in Chapter 2. Existing literature states that the demand for organic food is low in the domestic market in Turkey (Tetik, 2012). In Chapter 2, the study analyzes the profile of Turkish organic food consumers in accordance with their socio-demographical characteristics, food preferences, purchase frequencies and characteristics, environmental awareness and knowledge on environmental issues, thoughts and beliefs towards organic, health conditions and concerns, frequencies of doing physical activities, situation of smoking, willingness to pay for organic food products, information on organic logos, their confidence on organic logos, motivations and barriers while consuming, signals while purchasing organic food, their confidence on organic certification, the sources that they track general food advertisements and their confidence on them. Previous studies suggest that organic food demand is concentrated in urban areas in Turkey. Moreover, the data for organic food price and consumption is missing in Turkey. For this reason, a consumer survey is designed and conducted to 750 consumers living in the three biggest metropoles in Turkey; Istanbul, Ankara and Izmir. The study presents two different econometric models. In the first econometric model that estimates the likelihood of being an organic food consumer, binary logistic regression is applied as the dependent variable is binary- consuming organic food or not-. We aim to see characteristics of consumers and understand the consumer behavior and their preferences related to organic food demand in Turkey. The results show that organic food consumers are mostly mature, married, having higher income, doing physical activities and they are predominantly concerned about health issues, rather than environment and having food-related preferences and limited information on organic. It is seen that there is a strong income effect in organic food consumption, there is a negative and significant impact of nutrition and a positive and significant impact of taste. The second econometric model uses the data of organic food consumers in accordance with their reservation prices for organic food products. We have drawn a graph for Turkish organic food demand using the relative reservation prices that the participants have declared. We can see that this demand is segmented: one part being steeper than the other and for one segment organic food is a necessity while for the other it is a variety in the food choice.

The supply of Turkish organic food market is analyzed in Chapter 3. We provide with a profile of organic food producers in Turkey and examine the constraints and entry barriers in the sector. A producer survey is designed and conducted to 250 food producers in Turkey. The producers in the sample are chosen among the members of industrial and commerce chambers in Turkey as they were more accessible due to their registrations to these chambers. Binary logistic regression is applied. In the first part of econometric models, we aim to reveal organic food producer profile in terms of firm size, the use of governmental incentives, environmental consciousness and knowledge on environmental issues, unionizing and membership to professional associations, employees' education and training, entry barriers and constraints in the organic food

sector in Turkey. The results show that Turkish organic producers are environmental consciousness, mostly middle sized firms and unionized, experience that production costs such as transportation, certification, multiplicity of imported goods are important constraints in the organic food market and consider the unawareness of the organic term in the society as a problem for the development of this sector in Turkey. Regarding the results, environmental consciousness is an important characteristic of organic food producers in Turkey. There are differences in terms of constraints and entry barriers in the sector between organic food producers and conventional ones. In the second part of the econometric models, we have analyzed organic food producers in terms of their entry years, firm size and product types and found differences in terms of advertising channels, their attitudes towards the constraints in the market, environment consciousness, memberships to unions, and employees' education and training. The data also shows that the majority of the producers in the sample do not use government supports in organic agriculture.

In chapter 4, we construct a mathematical model to study asymmetric information problem and conclude on its impact on total welfare. We examine organic consumers with regard to their information level on organic food products and concerns on issues like health, environment. Moreover, we look into mislabeling problem in the organic food sector; we model the impact of mislabeling on the growth of the sector and on total welfare. The asymmetric information creates a negative externality in the market. The lack of information of consumers only benefits the mislabeling, unethical producers. The prices are not affected by the parameters related to the lack of information and mislabeling and thus the market price for organic food remains low and may even remain behind a sufficient level for the entry to the market. The lack of information on consumer side and the resulting moral hazard on producer side decreases the welfare in the market. The policies either aiming at the education of consumers on organic production and labelling or the control and audit of the market may definitely improve the welfare.

In Chapter 5, the findings, appropriate solutions and policy suggestions are underlined. The study on the organic food demand in Turkey reveals a profile for consumers and discusses it from different angles. The study provides significant results in this topic, including broader approach to food preferences, health status and conditions, and environmental awareness issues in the context of previous studies. In addition, organic food consumers are seen to segmented into two categories and important findings have been obtained for future studies on this topic. Referring the results obtained, organic food consumers give more importance to health issues rather than environmental ones. The impact of income is very strong. The lack of information of consumers a substantial problem in the growth of the organic food market. For this reason, policies to ameliorate consumers' information may be effective.

The study on organic food supply has the potential to be an important resource for policy makers, companies seeking to enter the sector or competing in the sector. There have been various problems in reaching producers in the study of organic food supply. Most producers were reluctant to respond to questions about financial issues. In addition, producers were asked about the effects of government supports on organic farming, but the majority of them did not receive government support. For this reason, the study was conducted with a focus on producers' perceptions of environmental

consciousness, level of education, memberships to unions and professional organizations, constraints, entry barriers and sectoral problems. Organic food producers were examined from different angles and organic producer characteristics that could be a guide for policy makers were compared in a matrix. This matrix can help policy makers to make the necessary incentives and policies in place.

The mathematical model in Chapter 4 clearly shows the impact of mislabeled products on the market. Consumers are supposed to be heterogeneous. The results show that a more controlled system in organic food production can solve information asymmetries about mislabeling and that policies for amelioration of consumer information and confidence on organic labels and certification may also help the growth of the organic food market. Moreover, a more concrete and sustainable organic farming policy including continuous government supports can improve the organic food supply in Turkey. In future studies, this model can be discussed in more detail by adding different parameters to the information asymmetry in the market.

To conclude, the thesis studies the demand, supply sides of the organic food market in Turkey and examine the asymmetric information problem in the market by using a mathematical model that focuses on the impact of mislabeling of organic products on welfare. Regarding the results obtained, the thesis can make several policy suggestions in terms of education, broadcasting, auditing and financial, infrastructural and institutional supports for producers.

ÖZET

İkinci Dünya Savaşı sonrası, tarımda yeni teknolojik gelişmeler ve yeşil devrim, tarım sistemine hâkim olmuştur. Konvansiyonel tarımın modernleşmesi ve teknolojik gelişmelerle birlikte yeşil devrim, dünyada gıdaya ulaşılabilirlik, kırsal alanlarda istihdam artışı gibi konularda olumlu gelişmeler sağlamıştır. Bu gelişmelerin yanı sıra, sağlık, çevre, biyolojik çeşitlilik ve ekolojik sistemler gibi konularda negatif dışsallıklar yaratmıştır ve bu konuda türlü eleştiriler vardır. Çevre kirliliği, yerli tohum türlerinin azalması ve zarar görmesi, toprak erozyonu, hayvan refahının azalması, GDOlu ürün ve yemlerin insan sağlığına olumsuz etkileri gibi sorunlara istinaden konvansiyonele alternatif sistem arayışlarına girilmiştir. Bu tez, konvansiyonel tarıma karşılık en öne çıkan alternatif sistemlerden biri olan organik tarım ve gıda piyasasını araştırmayı amaçlamaktadır.

1970'lerden itibaren, dünyada organik tarım yeni bir tarım hareketi olarak ortaya çıkmıştır. Organik tarım uygulamalarının dünya çapında yaygınlaştırılması için çeşitli uluslararası kuruluşlar kurulmuş ve birçok uluslararası standart organik üretim sürecini güvence altına almak adına oluşturulmuştur. 1990'lardan itibaren, ABD, AB üyesi ülkeler de dahil olmak üzere pek çok gelişmiş ülke, daha dinamik ve verimli bir organik tarım sistemini düzenlemek ve sürdürmek için organik standartlar uygulamaktadır. Günümüzde 178 ülkede organik tarım uygulanmakta olup 87 ülke kendi resmi standartlarına sahiptir.

Tezin amacı, dünya çapında ve Türkiye'de organik tarım ve gıda pazarına incelemektir. Organik tarım dünyada bir niş pazar olarak yer alırken günümüzde dünya çapında 80 milyar dolarlık satış hacmi ile gelişen bir sektör haline gelmiştir. Tüm dünyada son yıllarda organik tarım arazileri, organik üreticiler, kişi başı organik ürün tüketimi, organik ürün perakende satışları ve organik ürün üretim miktarı bakımından önemli artışlar olduğu görülmektedir. Organik gıda ürünlerinin yelpazesi ve çeşitliliği artmıştır, birçok büyük perakende zinciri organik gıda bölümleri açmalarının yanı sıra kendi organik markalarını oluşturmuşlar ve sektöre dahil olmuşlardır. Sektördeki çift haneli büyüme, gelecekte yüksek bir büyüme vaat etmektedir.

Türkiye'de organik tarım ve gıda pazarının gelişme potansiyeli yüksektir. Türkiye önemli bir tarımsal girdi üreticisi olarak yer almaktadır. Ülkedeki tarım arazileri gelişmiş ülkelerle kıyaslandığında suni girdilere daha az maruz kaldığı için organik tarım faaliyetleri için uygun bulunmaktadır. Türkiye'de organik tarım ilk olarak 1984 yılında yabancı şirketlerin girişimi olarak başlamıştır ve sözleşmeli tarımın bir parçası olarak uygulanmıştır. 1994 yılında, organik tarım mevzuatı

uygulamaya konmuş ve 2004 yılında ilk organik tarım yasası yürürlüğe girmiştir. Ülkede 2000'li yıllardan beri organik gıda pazarı büyümektedir, daha büyük perakende zincirleri sektöre girmiş, daha geniş bir ürün yelpazesi oluşmuştur. Organik gıdada yeni markalar piyasada rekabet etmektedir. Ayrıca, organik tarım kanununa ek olarak yeni mevzuatlar ve düzenlemeler AB organik tarım yasasına uyum kapsamında yürürlüğe girmiştir. Yatırım kredileri, alan ödemeleri, faiz oranında indirim, yayın desteği gibi devlet destekleri giderek daha kapsamlı olarak sağlanmaktadır. Ancak, Türkiye'de organik gıda ürünleri talebi hala sınırlıdır ve arz çoğunlukla ihracata yöneliktir. IFOAM (2012), Türkiye'deki organik üretimin %75'inin ihraç edildiğini belirtmektedir. Ayrıca, organik tarım alanları, üretim, kişi başı tüketim ve perakende satış hacmi gelişmiş devletlere nazaran Türkiye'de daha az seviyededir.

Araştırmacılar ve çevre aktivistleri organik tarımın çevre bilinci, hayvan refahı, biyolojik çeşitlilik, insan sağlığı konularındaki olumlu etkilerinden dolayı organik tarım hakkında çalışmalara ağırlık vermeye başlamışlardır. Çevreciliğin bir parçası olarak yeşil tüketim 1980'lerden beri önem kazanmaktadır (Allen ve Kovach, 2000) ve tüketiciler çevre dostu ortamlarda üretilmiş gıda ürünlerine yönelmeye başlamışlardır. Ayrıca, gıda ile ilgili hastalıklar tüketicileri gıda güvenliği ve konvansiyonel gıda ürünlerinin içeriğini sorgulamaya yönlendirmektedir. WHO (2017a), güvensiz gıda ürünlerinin zararlı bakteriler, kimyasal maddeler, virüsler, parazitler içerdiği için neredeyse 200 hastalığa neden olabileceğini ifade etmektedir. Bununla beraber, konvansiyonel hayvancılıkta hormon ve antibiyotik kullanımı insan sağlığı ve beslenmesinde çeşitli sorunlar yaratmakta, antibiyotiğe karşı dirençli bakterilerin oluşmasına sebep olmaktadır. Organik gıda ürünleri insan sağlığı ile pozitif ilişkilidir, çünkü suni girdiler, hayvan refahı, izlenen üretim süreci dahil olmak üzere genel ve spesifik koşulları garanti eden organik standartlara uygun olarak üretilir. Organik hayvansal üretimde antibiyotik ve hormon kullanımı yasaktır, hastalıklara karşı homeopatik yöntemlerin kullanımı esas alınmıştır. Çevre ve sağlık konusundaki endişelere ilişkin olarak, tüketicilerin bugün organik gıda ürünlerini tüketme olasılıkları daha yüksektir.

Organik tarım ve gıda piyasasının gelişmesinde bir takım sorunlar vardır ve tez çalışması bu konuları da ele almaktadır. Organik üretim standartlara tabi olarak yapılmaktadır bu sebepten ötürü üretim süreci daha fazla maliyet içermektedir. Sertifikasyon, geçiş süreci bekleme, analiz maliyetleri bu maliyetlerden bazılarıdır. Bu nedenle, organik ürünler konvansiyonel olarak üretilen muadillerine göre genellikle daha yüksek fiyatlıdır. Ayrıca, organik gıda ürünleri üzerine yapılan çalışmalarda tüketici güvensizliği ve piyasadaki hileli eylemler tartışılmaktadır. Organik üretim, çevre, sağlık, ekosistemler ve refah açısından daha fazla fayda sağladığından, bu sektörün büyümesini ve genişlemesini engelleyen kısıtlamalara bakmak önemlidir.

Bu çalışmanın kapsamı, Türkiye'de organik tarım ve gıda pazarının talep ve arz yönlerini analiz etmek ve organik ürünlerin yanlış etiketlenmesinin oyun teorisi yaklaşımıyla toplam refah üzerindeki etkisini modellemektir. Çalışmada organik tarım ve gıda piyasası detaylı bir şekilde incelenmiş olup, organik tüketici ve üretici profilleri çıkarılmış ve yanlış etiketleme problemi ele alınmıştır.

Birinci bölümde dünyada ve Türkiye'de organik tarım ve gıda pazarı nesnel bir yaklaşımla detaylıca açıklanmaktadır ve karşılaştırmalı bir analiz sunulmaktadır. Sektörün çeşitli yönlerden incelenmesi açısından, bu bölümde ilk olarak organik tarım tanımı, prensipleri, tarihçesi, faydaları ve avantajları, yapılan eleştiriler ve dezavantajları, sürdürülebilirlik ile olan ilişkisi, organik gıda arzı kapsamında organik üretim sistemi, tedarik zinciri, sektördeki engeller ve giriş engelleri tartışılmıştır. Organik tarım, daha sağlıklı ve çevre dostu sürdürülebilir bir üretim sistemi olarak konvansiyonel tarım ve üretim bir alternatif olarak ortaya çıkmıştır. Organik tarım ilkeleri temel olarak ekosistem, biyoçeşitlilik, hayvan refahı, halk sağlığı, toprak koruma, gıda üretiminde daha sürdürülebilir bir sistemin geliştirilmesine yoğunlaşmaktadır. GDO ve sentetik ürün kullanımı kesinlikler organik yarımda yasaktır. Ayrıca, bu bölümde organik tarım hakkındaki eleştirilere ve dezavantajlara da yer verilmiştir. Bu eleştiriler organik tarım ve gıda pazarının daha kurumsal bir sektör haline gelmesi, bir takım bakteri yayılmalarına yol açması ve daha uzun mesafeler ile üreticiye ulaşması konularını incelemektedir. Tüm bunlarla beraber, organik üretim süreci, dağıtım kanalları bu bölümde anlatılmıştır. Organik gıda pazarı artık daha büyük bir Pazar haline geldiğinden dolayı, dağıtım kanalında daha fazla perakendeci ve aracı yer almaktadır. Bu bölüm, arz tarafındaki kısıtlamalara ve organik gıda talebini olumlu ve olumsuz etkileyen faktörleri kısaca ele almıştır. Bu konular Bölüm 2 ve 3'te daha ayrıntılı olarak tartışılmış ve analiz edilmiştir.

Birinci bölümün devamında organik tarım ve gıda pazarı hakkında organik tarım, hayvancılık üretimi, su ürünleri yetiştiriciliği ve arıcılık, organik tarım politikaları ve kurumların ve STK'ların organik tarım ve gıda pazarı üzerindeki etkileri gibi alanları içeren karşılaştırmalı bir analiz yapılmıştır. Bu analizde ilk olarak dünya genelindeki genel durum incelenmekte, sonrasında ise ABD, AB ve Türkiye analiz edilmektedir. ABD ve AB dünyadaki en büyük iki organik gıda pazarı ve Türkiye için de organik gıda ticaretinde önemli ihracat pazarları oldukları için, bu bölümde bu ülkelerin organik tarım istatistikleri ve politikaları ayrı alt bölümlerde açıklanmıştır. Çalışmanın kapsamı Türkiye'ye odaklandığından, organik gıda pazarına ilişkin Türkiye istatistikleri, organik tarım politikası da detaylı olarak açıklanmaktadır.

ABD ve AB'nin organik gıda pazarında lider pazarlardır. Türkiye ise organik üretim, kişi başına tüketim, perakende satış açısından birçok gelişmiş ülkenin gerisinde kalmıştır. Türkiye'nin organik tarım için uygun arazilere sahiptir fakat pazarın gelişimi bir takım iyileştirmeler gereklidir.Türkiye’de önemli bir sayıda organik üretici bulunmaktadır. Türkiye'de organik tarım alanları, üretim miktarı, hayvancılık üretimi açısından arz tarafında yüksek dalgalanmalar olduğu görülmektedir. Ayrıca, organik su ürünleri yetiştiriciliği gibi bazı önemli üretim alanları henüz gelişmemiştir. Devlet desteklerinden yararlanan üreticilerin sayısında da dalgalanmalar mevcuttur. Organik tarım politikaları ve organik standartlar ikiye ayrılmaktadır. İlk olarak ulusal hükümetlerin kendi politikaları ve standartları mevcutken, IFOAM ve Demeter gibi uluslararası kuruluşlar da standartlar geliştirmektedir. Uluslararası örgütlerin standartlarının ulusal standartlardan daha sıkı kurallar içerdiği görülmektedir. Organik tarım politikaları ABD, AB ve Türkiye'de genel olarak benzer maddeler içermektedir. Bu politikalarda onaylanan metodoloji, izin verilen yan maddeler, etiketleme açısından küçük farklılıklar görülmektedir. Türk organik tarım kanunu AB'ye uygun olarak tasarlanmıştır. AB yeni bir mevzuat hazırlamaya başlamıştır bu sebepten ötürü Türkiye mevcut organik tarım mevzuatında da düzenlemeler yapabilir. Ayrıca, AB'nin Türkiye için önemli bir ihracat pazarı

olması nedeniyle, Türkiye'nin AB üçüncü ülkeleri listesinde sınıflandırılması bir takım düzenlemeler yapılmalıdır, zira Türk firmalarının AB üyesi ülkelere organik ürün ihracatı yapabilmesi için bu listede Türkiye'nin yer alması gereklidir. Dünya çapında bilgi, teknik bilgi, tartışma, istatistik, yayınlar, konferanslar, toplantılar sağlayan çeşitli kurumlar ve STK'lar bulunmaktadır. ABD ve AB'de, bilimsel araştırmalar yürüten üniversitelere bağlı enstitüler ve organik üreticiler için hibeleri teşvik eden STK'lar bulunmaktadır. Türkiye'de bilimsel çalışmalar yapan üniversite kapsamında yer alan enstitüler bulunmaktadır ve STK'lar çoğunlukla tüketici bilgisinde, organik pazarların ve pazarların organizasyonunda ve üretici firmalarda faaliyet göstermektedir. Genel olarak, Türkiye'de organik tarım ve gıda pazarının talebinin ve arzının gelişmiş pazarların seviyelerinin gerisinde olduğunu görmekteyiz. Bu nedenlerle bu çalışma, bu piyasadaki engellere ve politika önermelerine odaklanmaktadır.

Dünyada ve Türkiye'de organik tarım ve gıda pazarına genel bir bakıştan sonra, çalışma ikinci bölümde Türkiye'deki organik gıda talebini ele almaktadır. Var olan çalışmalar ve literatür, Türkiye'de iç piyasada organik gıda talebinde engellerin olduğunu göstermektedir (Tetik, 2012). Bu bölümde inceleme alanları tüketicilerin sosyo-demografik özellikleri, gıda tercihleri, satın alma sıklıkları ve özellikleri, çevre konusundaki farkındalıkları ve bilgileri, organik gıda ürünlerine karşı tutumları ve davranışları, sağlık durumları, bu konudaki endişeleri, spor yapma sıklıkları ve sigara içme durumları, organik ürünleri ödeme istekliliği ve rezervasyon fiyatları, organik gıda ürünleri hakkında bilgi seviyeleri, organik ürün logoları hakkındaki bilgiler ve logolara olan güven, organik gıda tüketimini motive eden etmenler ve tüketirken karşılaşılan engeller, satın alımda organik gıda ürünleri fark etmedeki ibareler, organik sertifikasyona olan güvenleri, genel olarak gıda reklamlarını takip ettikleri mecralar ve gıda reklamlarına olan güvenleridir. Önceki çalışmalar, organik gıda talebinin Türkiye'de kentsel alanlarda yoğunlaştığını göstermektedir. Türkiye'de organik gıda fiyat ve tüketim verileri ne yazık ki kısıtlı ve eksiktir. Bu nedenden ötürü, bu çalışma bir tüketici anketi kapsamında yapılmaktadır. Hazırlanan ve uygulanan tüketici anketi Türkiye'nin en büyük 3 metropolü İstanbul, Ankara ve İzmir'de yaşayan 750 tüketiciye yapılmıştır. Çalışma iki farklı ekonometrik model sunmaktadır. Organik gıda tüketicisi olma olasılığını tahmin eden ilk ekonometrik modelde ikili lojistik regresyon uygulanmaktadır ve bağımlı değişken organik gıda tüketip tüketmemedir. Sonuçlar, organik gıda tüketicilerinin çoğunlukla daha yetişkin, evli, daha yüksek gelire sahip olduklarını, fiziksel aktivitelerde bulunduklarını ve ağırlıklı olarak çevre ve gıda ile ilgili tercihlerden ziyade sağlık sorunları hakkında endişe duyduklarını ve organik hakkında sınırlı bilgi sahibi olduklarını göstermektedir. Organik gıda tüketiminde gelir seviyesinin önemli bir etkisi olduğu saptanmıştır, organik gıdaların besleyiciliği ve tüketimi arasında ise negatif anlamlı bir ilişki vardır. Organik gıda tüketimi ve organik gıdaların lezzetli olması arasında pozitif ve anlamlı bir ilişki bulunmuştur. İkinci ekonometrik model, organik gıda tüketicilerini organik gıda ürünleri için rezervasyon fiyatlarına göre segmentlere ayırmaktadır. Katılımcıların beyan ettikleri nispi rezervasyon fiyatları kullanılarak Türk organik gıda talebi için bir grafik oluşturulmuştur. Organik gıda talebinin 2 bölüme ayrıldığı görülmektedir; grafiğin bir parçası diğerinden daha diktir ve organik gıda tüketicilerinin bir bölümü için organik gıda bir ihtiyaç iken, diğeri grup için organik gıda tercihi yiyecek seçiminde bir çeşitliliktir ve bu grup organik gıda tüketimi lüks tüketim olarak görmektedir.

Üçüncü bölümde Türkiye'deki organik gıda arzı analiz edilmektedir. Daha önce de belirtildiği gibi Türkiye'de organik gıda alanında fiyat ve tüketim verileri eksiktir, bu nedenle çalışma kapsamında yapılan üretici anketi sonuçları bu bölümde incelenmektedir. Üretici anketi Türkiye'deki 250 gıda üreticisine yapılmıştır. Örneklemde yer alan üreticiler, ulaşma kolaylığı açısından ticaret ve sanayi odaları üyeleri arasından seçilmiştir. Bu bölümde yer alan ekonometrik modellerde ikili lojistik regresyon uygulanmaktadır. İlk ekonometrik modelde, organik gıda üreticileri firma büyüklükleri, devlet teşviklerinden yararlanma durumları, çevre bilinçleri ve çevre konusundaki bilgileri, sendika ve profesyonel kuruluşlara üyelikleri, çalışanlarının eğitim alma düzeyi, sektördeki giriş engelleri ve sektörde yaşadıkları kısıtlar açısından incelenmektedir. Bu modelin sonuçlarına göre, Türkiye'de organik üreticileri çevre bilinçleri yüksek, çoğunlukla orta ölçekli firma sahibi ve sendikalılardır. Ayrıca, organik gıda piyasasında ulaştırma, sertifika maliyetleri ve ithal malların piyasada yer almasını önemli kısıtlamalar olarak görmekteyken, konvansiyonel üreticiler ise toplumda organik terimin farkındalığının eksik organik sektör için bir giriş engeli olarak belirtmektedirler. Bu sonuçlara istinaden, çevre bilincinin organik gıda üreticileri için önemli bir özellik olduğu görülmektedir. Sektöre girmemiş ve sektörde yer alan üreticiler açısından farklı zorluklar ve engeller olduğu görülmektedir. Çalışmada daha farklı ekonometrik modeller uygulanmış olup, bu modeller organik gıda üreticilerini sektöre giriş yılı, firma büyüklüğü, ve hammadde ya da işlenmiş organik ürün üretiyor olma durumları açısından incelemektedir. Giriş yılı olarak Organik Tarım Kanunu'nun yürürlüğe girdiği yıl olan 2004 yılı baz alınmıştır. Sonuçlara göre organik gıda üretici arasında reklam kanalları, piyasadaki kısıtlamalara karşı tutumlar, çevre bilinci, sendika üyelikleri ve çalışanların eğitim ve öğretimi açısından farklılıklar bulunmaktadır. Anket verileri ayrıca göstermektedir ki, örneklemdeki üreticilerin çoğu organik tarımda devlet desteklerini kullanmamaktadır ve sektördeki sorunların hepsi hakkında bilgi sahibi değillerdir.

Dördüncü bölümde, bu çalışmada incelenen organik tarım ve gıda pazarındaki asimetrik bilgi sorununu incelemek ve refah konusunda çıkarım yapmak için oyun teorisi yaklaşımı çerçevesinde matematiksel bir model oluşturulmuştur. Organik tüketicileri organik gıda ürünleri konusundaki bilgi düzeylerine ve sağlık, çevre gibi konulara ilişkin kaygılarına göre incelenmektedir. Arz kısmı konvansiyonel ve organik talebine göre şekillendirilmiş, organik gıda talebi organik olarak etiketlenen ve konvansiyonel ürün olup organik olarak yanlış etiketlenen ürünlerin talepleri olarak ikiye ayrılmıştır. Böylece bu piyasadaki yanlış etiketleme ile ortaya çıkan asimetrik bilgi sorunun toplam refah ve piyasaya olan etkisi incelenmektedir. Sonuçlara göre, asimetrik bilgi bu piyasada negatif bir dışsallık yaratmaktadır. Tüketicilerin bilgi eksikliği sadece yanlış etiketleme yapan etik olmayan üreticilere yarar sağlamaktadır. Organik gıda fiyatları tüketicinin bilgi eksikliği ve yanlış etiketleme ile ilgili parametrelerden etkilenmemekte; bu nedenle organik gıda için piyasa fiyatı düşük kalmakta ve hatta piyasaya giriş için yeterli bir seviyenin arkasında kalabilmektedir. Tüketici tarafında bilgi eksikliği ve üretici tarafında ortaya çıkan ahlaki risk, piyasadaki refahı azaltmaktadır. Tüketicilerin eğitimini artırmaya, organik üretim ve etiketleme ve de bu piyasanın kontrol ve denetimine yönelik politikaların refahı artırabileceği sonucuna varılmıştır.

Beşinci bölümde tez çalışmasında elde edilen bulgular ve uygun çözümler üzerinde durulmaktadır. Çalışmada karşılaşılan durumlar, kısıtlar ve elde edilen sonuçlar politika önerileri ile sunulmaktadır. Bu çalışmanın talep bölümü Türkiye'deki

organik gıda tüketicisini farklı açılardan ele almakta ve profil vermektedir. Yapılan çalışma önceki çalışmalara istinaden daha geniş kapsamlı, genel gıda tercihleri, sağlık durumları, çevre bilinci konularını da kapsayarak önemli sonuçlar vermektedir. Ayrıca nispi rezervasyon fiyatları çerçevesinde organik gıda tüketicileri ikiye ayrılmış ve bu alanda ileriki çalışmalar için önemli bulgular elde edilmiştir. Elde edilen sonuçlara göre, tüketicinin sağlık sorunlarına çevre konularından daha çok önem verdiği ortaya çıkmıştır. Gelir organik gıda tüketiminde güçlü bir etkiye sahiptir. Tüketicinin tam olarak bilgili olmaması talebin gelişmesi açısından önemli bir sorundur. Bu nedenle tüketici bilgisini artıracak politikalar yararlı olabilir.

Organik gıda arzı çalışması, politika yapıcılar ve sektöre girmek isteyen ya da sektörde rekabet eden firmalar açısından önemli bir kaynak olma potansiyeline sahiptir. Organik gıda arzını kapsayan bu çalışmada üreticilere ulaşmada çeşitli kısıtlar yaşanmıştır. Mali konuları içeren sorulara cevap vermede çoğu üretici isteksiz olmuştur. Ayrıca devlet desteklerinin organik tarımdaki etkilerini görmek amacıyla üreticilere sorular sorulmuş, fakat örneklemdeki çoğu üreticinin devlet desteği almadığı ortaya çıkmıştır. Bu sebeple çalışma üreticilerin çevre bilinçleri, eğitim seviyeleri, sendika ve profesyonel kuruluşlara üyelikleri, giriş engelleri ve sektördeki problemler üzerine görüşlerini içeren bir odakta yapılmıştır. Farklı açılardan organik gıda üreticileri incelenmiş, politika yapıcılar için rehber olabilecek organik üretici özellikleri bir tablo halinde sunulmuştur. Bu tablo politika yapıcılar için gerekli teşvikler ve politikaların yürürlüğe konması açısından yardımcı olabilir.

Dördüncü bölümde yer alan matematiksel model piyasada yer alan yanlış etiketli ürünlerin toplam refaha olan etkisini açıkça göstermektedir. Bu model tüketicileri heterojen olarak varsayar. Sonuçlar organik gıda üretiminde daha çok denetlenen bir sistemin yanlış etiketleme konusunda bilgi asimetrilerini çözebileceğini, tüketicilerin bilgi ve organik etiketli ürünlere olan güvenini artırma konusunda devlet desteğinin organik gıda talebinin büyümesine yardımcı olabileceğini göstermektedir. Dahası, sürdürülebilir ve sürekli devlet desteklerini içeren daha somut bir organik tarım politikası, Türkiye'de organik gıda tedarikini geliştirebilir. İleriki çalışmalarda bu modele daha farklı parametreler eklenerek piyasadaki bilgi asimetrisi daha detaylı ele alınabilir.

Sonuç olarak, bu tez çalışması, Türkiye'de organik gıda pazarının arz, talep yönlerini incelemekte ve piyasada yer alan bilgi asimetrisi sorununu matematiksel bir model yolu ile ele almaktadır. Elde edilen sonuçlarla ilgili olarak tez, üreticilere yönelik eğitim, yayın, denetim ve finansal, altyapı ve kurumsal destekler açısından çeşitli politika önerileri sürmeye yöneliktir.

1. THE COMPARATIVE ANALYSIS OF TURKISH ORGANIC FOOD MARKET

1.1. THE CREATION OF THE ORGANIC FOOD MARKET

From the Industrial Revolution, innovation has started to take part in many sectors such as agriculture, mechanics, business, and all aspects of life and the production process has been much more systematically disciplined than before. Mediocre sectors have converged to systemized advanced industries. In accordance with the global change in terms of social issues, economics, and technology; many new industries have aroused. However, as the technological change has affected all aspects of daily life, it has also caused some problems and inefficiencies in the society.

Since the hunter and gatherer era, nutrition and feeding have been the main drivers to form societies. Agriculture is the milestone in the history; the mankind has built-in with agricultural activities. Agriculture has been a substantial contributor for basic human needs like feeding; it has become one of the main industries providing inputs for other sectors, it has shaped foreign trade, income level and social trends by the time.

Farming systems have been more mechanized since the industrialization and World War II, in accordance with technological and social developments. New trends in the food industry have formed due to health and environmental concerns. The thesis will address a new segment in the food industry. Organic food sector has been considered as an important movement in societies in the 21st century. In order to examine and discuss organic food sector, it is important to know some definitions and terminologies referring to organic, food, public health.

1.2.DEFINITION AND PRINCIPLES OF ORGANIC AGRICULTURE

Organic farming is an agricultural pursuit that uses natural and environmental-friendly techniques and eliminates chemical and synthetic invasions during the production. FAO defines organic agriculture as an ecosystem management rather than a production based on external agricultural inputs (FAO, 2018a). Similar definitions are made by different international entities and governments such as Codex Alimentarius, an establishment of WHO and FAO for implementing food standards emphasizes organic agriculture as a holistic system and define organic agriculture as "a comprehensive production system which sustains agro-ecosystem health, increases biodiversity, and soil quality". It stresses the use of closed cycle inputs instead of adding substances, considering that each region has a unique system (FAO & WHO, 1999). The US Department of Agriculture (USDA) National Organic Standards Boards (NOSB) defines and explains organic agriculture as an ecological production management system enhancing biodiversity, biological cycles and soil biological activity with the minimum use of off-farm inputs and on management practices (USDA, 2016a).

International Federation of Organic Agriculture Movement (IFOAM) addresses four principles of organic agriculture. Firstly, the principle of *health* aims to sustain and enhance the health of soil and all living beings on the planet. It explains the integrity of the health of individuals, communities and ecosystem; and it highlights that the healthy soil is necessary to feed healthy people and animals. Secondly, the principle of *ecology* states that ecological environment and recycle must be sustained by the reuse energy inputs, conservation of resources, improving environmental quality and protecting the biodiversity. The third principle is *fairness*. It contributes to maintain a fair human relationship between all parties involved in organic agriculture -farmers, processors, distributors, traders and consumers- to produce a sufficient supply of good quality food and other products and to ensure animal welfare. Lastly, the principle of *care* accounts for precaution and responsibility as main drivers in

organic management and clarifies that it is crucial to choose the technologies regarding their effects on nature (IFOAM, 2018a). These principles are considered as the roots of organic agriculture.

Many scientists discuss the organic production from similar perspectives, some scholars define it as a protest movement against the conventional agricultural system that has been industrialized since the Industrial Revolution. From this perspective, organic production system refuses to use any chemical drugs, pesticides and fertilizers, and fights against the globalization of agriculture. Conventional agriculture in global aspects causes longer mileage[1], barriers to produce healthy food products in accordance with their local characteristics (Alrøe and Noe 2005). It is also noteworthy to say that organic production is a holistic system that goes from the land to the table as FAO defines.

[1] Mileage defines the distances made from crop, production, marketing, sales processes.

1.3.IMPORTANCE AND HISTORY OF ORGANIC AGRICULTURE

The word “organic” is firstly referred in an academic journal by Rodale in 1942. In 1920s, organic farming has been developed as an alternative technique in agriculture with no use of chemicals as a scientific-based suggestion regarding negativities on soil and food quality but it has not been a well-discussed topic until 1970s, when environmental concerns aroused (Vogt, 2007). It is important to mention that the use of natural resources in accordance with ecological principles have been put into practice from BC, in the hunter and gatherer era. It is generally suggested that the organic farming has started by Rudolf Steiner’s approach in 1924, in Germany. He was the founder of “Anthroposophy” and he had given many lectures about the effects of agricultural innovation on social and scientific dynamics (Shi-ming and Sauerborn, 2006). Anthroposophy is a spiritual rationalism that combines natural sciences and inner development of the mankind; it argues that the mankind has to live in compliance with the nature and its disciplines, without any artificial impact. Historically, it is also argued that the “organic” terminology is firstly used in Lord W. Northbourn’s book, “Look to the Land”, where the organic movement represents an ecological approach, and an alternative to conventional agriculture. The author was impressed by Steiner’s works and claimed that agricultural activity should maintain an organic life cycle and be a holistic entity (Kristiansen and Merfield, 2006). From this point of view, organic agriculture projects the necessity of local and pure resources in agriculture. Many westerns scientists have observed the importance of applying non-industrialized approach in agriculture; many of them analyzed far eastern wild agricultural production that has similar principles with the organic agriculture. At that time, many novels describing organic philosophy in practice are written.

Rodale Institute highlights Jerome Irving Rodale’s contributions, as he was one of the pioneers who worked on organic farming theory. He moved to rural

Pennsylvania in US to analyze and study healthy soil applications in farming. His main focus was to use healthy resources to get healthier products in farming. He released an academic journal named "Organic Farming and Gardening" later named "Organic Gardening" today. He firstly used the "organic" terminology in his academic study "Fact Digest". He also established "Soil and Health Research Center" in 1947, it is called "Rodale Institute" today[2].

There are many other contributors to organic farming in history. Lady Eva Balfour as a colleague of Rodale, Mokichi Okada in Japan are important scholars and appliers of organic farming. The "Green Revolution" highlights technological improvements in agriculture, however, the use of synthetics and artificial components has caused social and ecological problems and organic movement has become an alternative to prevent damages caused by the conventional industrialized agriculture. Not only scientists and idealistic producers, but also international entities, governments and organizations have started to support organic movement. Many NGOs and other non-profit organizations help to spread organic agriculture and its principles from the early 20th century. International Federation of Organic Agriculture Movement (IFOAM) was established as a global network in 1972, it can be considered as the main organizing entity of organic standards and principles worldwide. Stiftung Ökologie und Landbau (SÖL), Bioland, Fédération Nationale d'Agriculture Biologique (FNAB), Forschungsinstitut für Biologischen Landbau (FiBL), the Louis Bolk Institute are also remarkable organizations.

The word "Organic" expresses organ and vitality. As Olioso (2008) claims, the word is derived from a musical instrument name in Latin "argonan". Hamzaoui Essoussi and Zahaf (2008a) explains that the term "organic" is rooted in "bio" from Greek "bios" meaning life or way of living while there is no clear definition and standard regarding "natural food". They also point out that organic is considered as "natural" in Agriculture Canada. The organic agriculture and philosophy underline its closeness to the naturalness. Many other names such as "ecologic", "biologic", "additive-free", "natural", "from the land", "fresh" can be considered as "organic" by

[2]Source: Rodale Institute Official Website: http://rodaleinstitute.org/about-us/mission-and-history

consumers. However, as EU legislation claims “ecologic”, “biologic” and “organic” mean the same context. Food products labeled under names such as natural, free range etc. can contain artifices and cannot be certified as “organic” (e.g. livestock that are raised in rural areas and in wild life can be contaminated by air pollution, and there are no specific standards for free range poultry production). Thus, similar names may cause misperception problems for consumers.

Organic agriculture is in line with the principles and logic of a living organism, in which all elements (soil, plant, farm animals, insects, the farmer and local conditions) are closely related as Scialabba (2015) explains. The Guidelines of Organically Food Produce of the Codex Alimentarius (WHO & FAO, 2007) and the principles of IFOAM (2018a) on organic agriculture are commonly state that an organic production system serves to enhance biological diversity and soil biological activity with healthy use of soil, water and air (to minimize the pollution), maintain long-term soil fertility, lead to recycle wastes of plant and animal origin for limiting the use of non-renewable resources and increasing the use of renewable resources. Such a production system involves agronomic, biological and mechanical methods and applies natural ecosystem as a model (Scialabba, 2015). In organic agriculture several techiques have been used: intercropping, composting, mulching, integration of crops and livestock. Mulching includes to cover the whole land with dead plant material in order to control the weeds and the soil in annual planting. Intercropping means to grow two annual crops together, it is generally done while producing leguminous crops like beans or a green manure crop in alternating rows with maize or another cereal crop or vegetable as Scialabba (2015) indicates. Intercropping is a common activity in organic agriculture as it allows to diversify the production and obtain the maximum yields in return. Composting is essential in organic agriculture as it is highly effective in the growth of crops while there is no use of synthetic inputs. Using crop rotation is the basic rule for organic agriculture (Scialabba, 2015). Lastly, IFOAM (2018a) defines organic agriculture as a system aiming to maintain the health of soil, animals, individuals and combine ***innovation, tradition*** and ***science*** in order to benefit the shared environment, sustain ***fair relationships*** and ***a good quality of life*** for all planet.

1.4.BENEFITS AND ADVANTAGES OF ORGANIC AGRICULTURE

After examining the organic movement at a glance, it is important to denote the benefits and advantages of producing and consuming organic food. Besides, benefits and advantages for developed and developing countries may differ. In many developed countries, the benefits of organic food products are listed as supporting biodiversity, ecology, reducing the energy use and carbon emissions. In developing countries, the benefits may be seen as an increase in yield without additional inputs in agriculture, sustainable production, employment of local population, and preserving biodiversity (Stockdale et al, 2001). More systematically, Rehber (2011) classifies benefits and advantages in terms of ecology, nutrition, bio-diversity, animal welfare, socio-economics.

Several studies compare the effects of conventional and organic agriculture on soil and ecology. Some argue that there is no significant difference between these (Dabbert, 2006), on the other hand, FAO expresses that organic agriculture has less negative impacts on soil and the nature in comparison with conventional agriculture. Since organic farming has no use of artificial inputs, it has an advantage to accelerate the healing process of the soil that is affected by carbon emissions and greenhouse gas releases, thus it helps to reduce climate change negative externalities, prevent soil erosion, increase soil minerals and vitamins. Bos et al. (2014) highlight that energy use and greenhouse gas releases rate per unit diary milk is 5-10% lower in organic farming; however, they also add that they are higher in per unit organic crop production and vegetables. From another perspective, non-organic fertilizers might cause lack of vitamins and minerals in the soil, thus organic agricultural activities form a preservation function for the soil quality (Casey and Holden, 2006). Moreover, many developed countries such as EU, Canada claim that organic agriculture must be spread out and it aids to prevent soil erosion in their legislations.

Nutrition is another important aspect related to organic food. As one of the main motives behind the increasing demand for organic food, health is correlated with nutritional values. Some studies show that organic and conventional food products are not different in terms of their content of nutritional values; however, several studies emphasize that nutritional values of organic foods are higher (Brandt and Mølgaard, 2001). It is important to highlight that organic agriculture is not a backward movement, it brings together all natural processes and creates a healthier alternative for conventional agriculture. A study at Stanford University found that organic food products are higher values in terms of vitamins, minerals, good fat acids, antioxidants, proteins (Stanford Medicine, 2012). It is important to note that chemical free products reduce the risk of allergy, hyperactivity in children and cancer, Parkinson diseases in general (Worthington, 1998; DiMatteo, 2004).

Organic agriculture has a positive impact on biodiversity. Conventional agriculture may look like promising in terms of the increase in productivity and there are proofs that it has contributed to create varieties, but there are many studies showing that organic agriculture has better impacts on biodiversity rather than conventional system (Hole et al., 2005). In addition to this, a study observing the natural bird habitat shows 6 kinds out of 16 increased in numbers in areas that are organically cultivated. There is no strict evidence that organic application has a positive impact on other 10 kinds, but in the conventionally cultivated areas, most of the kinds are extinct (Chamberlain et al., 2009). There are significant results showing that applying organic production methods generates more varieties as Rahmann (2011) states.

In terms of animal welfare, it is possible to argue that organic livestock production has been standardized by severe rules in order to provide a healthier habitat including a free range air space, no use of antibiotics and hormones, use of homeopathic treatment, a natural duration for slaughtering, no stress and disease causing environments, organic and natural feeds (no GMOs containing feeds, artificial vitamins and proteins), thermal and physical comfort zones (Spoolder, 2007). Moreover, organic livestock production maintains a better living atmosphere and treats animals ethically. In the majority of legislations, the use of drugs is strictly limited. International organizations such as WHO suggests to limit the use of veterinary drugs;

the use of antibiotics are reduced to minimal amounts in many countries (WHO, 2017b). In addition, Jeong et al. (2010) point out that the use of antibiotics in conventional livestock production has a growing hormone effect, thus overgrown livestock might be produced in a shorter duration of time. Smith-Spangler et al. (2012) found that consumption of conventionally produced livestock is more likely to cause an exposure of antibiotic-resistant bacteria.

From the socio-economical perspective, the theory behind the organic agriculture supports local farmers and communities. Thus, it is important to note that local farmers' population has fallen since the industrialization of agriculture (Green and Maynard, 2006). The organic movement has encouraged young farmers, it has informed the public about health concerns and brought sustainability in agriculture, increased income levels of local farmers (Lyons and Burch, 2008). Young farmers are more willing to be a part of the organic movement. Since the organic agriculture has got a labor intensive structure, it has a positive impact on the employment in rural areas (Green and Maynard, 2006). Also, social injustice and hunger issues, fair trade principles are taken very seriously by IFOAM.

1.5.SUSTAINABILITY AND ORGANIC AGRICULTURE

Agriculture is a human activity since the domestication of land in which natural resources are main inputs. Grain production has been a substantial driver in primitive societies. After the Second World War, there have been significant improvements in chemical industry and other sectors, thus agriculture is also affected by this technological revolution and industrialized agriculture has aroused. Gaining more returns in yields and profits in land, reaching a higher amount of food products have become possible since 1960's. The accelerated increase in production is related with a new agricultural and technological phase, called "Green Revolution". It made possible to create new genetically improved organisms such as crop varieties, chemical fertilizers, antibiotics (for livestock production) and agricultural activity offered high returns in production. While considering the growth in population, such an increase in returns looked tempting. Food prices decreased in many developing countries mainly in Asia, poor population got rid of poverty (IFPRI, 2002). Malthusian population theory that predicted a geometric increase in human population growth and an arithmetic increase in food production and natural resources did not happen, the Green Revolution and technological progresses have had impacts to prevent a case such as Malthus postulated.

Despite its contributions, the Green Revolution has been criticized by its negative impacts on nature, biodiversity, inappropriate use of artificial fertilizers and mechanic production system to increase the yield. The food product content is also under debate because of the use of synthetized inputs in the industrialized agricultural production. As it is mentioned earlier, organic movement may be considered as a healthy alternative or a protest to the negative impacts of the Green Revolution. From another perspective, it is necessary to ask whether the Green Revolution is the only solution to feed the world.

To discuss the problem of feeding the world population, it is important to emphasize that the world population is 7.6 Billion as of 2018 and the estimated numbers are 8.5 billion in 2030, 9.7 billion in 2050 and 11.2 billion in 2100, as UN report denotes (UN, 2015). Almost 795 Million of the world population deals with hunger today (1/9 of the world population) and 12.9% of the population is undernourished. Moreover, the hungry population mostly comes from developing countries in Africa. The report also claims that if female farmers have access to the same resources, the population with hunger problem will decrease by nearly 150 Million people. Tragically, poor nutrition causes 3.1 Million children's death per year and 1 out of 6 children -almost 100 Million- is underweight (WFP, 2015).

Regarding these statistics, it is important to question whether the resources are consumed away worldwide. A counter argument answers this question; the wasted quantity of food is bigger than the needed amount of food for hungry population in the world. FAO (2014) defines food losses and waste as *"the edible parts of plants and animals produced for human consumption but are not ultimately consumed by people"*. According to FAO (2018b), almost 1.3 billion tones food is wasted or gets lost annually in the world and this accounts for 1/3 of the food production. Financially, these losses and waste count for 680 Billion USD and 310 Billion USD in developed and developing countries, respectively. The most wasted food types are fruit and vegetables. Rich countries' food waste is around 222 Billion tones, near to the net food production number in Sub Saharan countries (230 Billion tones). The statistics also show that the amount of wheat wasted annually is 280 Million tones, whereas the amount of the needed wheat is 80 Million tones. To conclude, the statistics show a social disparity in terms of nutrition and the access of food worldwide (FAO, 2018b). Figure 1.1 shows per capita food losses and waste by regions.

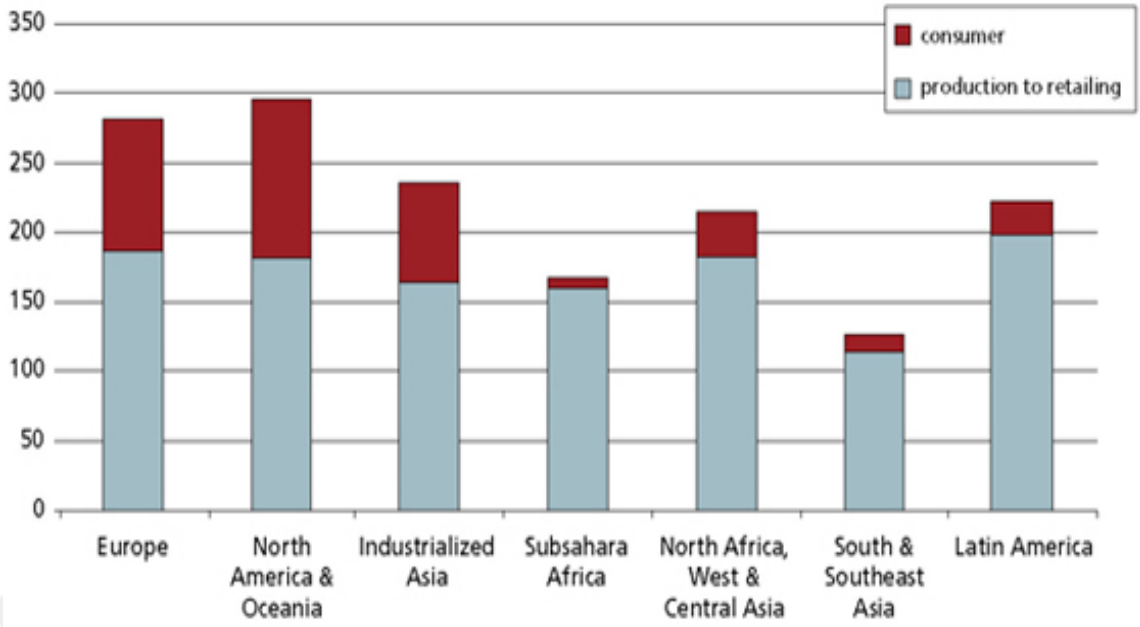

Figure 1.1 Per Capita Food Losses and Waste (Kg/Year) by Regions[3]

In Turkey, food losses and waste are also problematic. The most wasted food product type is also fruit and vegetables. The total edible food losses and waste are 26.04 Million/year (Salihoğlu et al., 2018). As Table 1.1 shows, the produced food gets lost or is wasted during the agricultural production mostly. The mostly lost and wasted product type is fruit and vegetables.

In terms of the excessive use of resources, the Green Revolution and conventional agriculture are mostly criticized. All the damage they create, might limit the land productivity, soil health and biodiversity. Ecological concerns related to preserving biodiversity, eliminating climate change effects are substantial discussions in the world today. In 2015, United Nations Framework Convention on Climate Change (UNFCCC) prepared a climate change agreement in Paris that is signed by member states. One of its principles is about food production and it is highlighted as *"the vulnerabilities of food production systems to the adverse impacts of climate change"* (UNFCCC, 2015). Recently, new critics appeal to argue about greenhouse

[3] Source: FAO, "Global food losses and food waste – Extent, causes and prevention", Study conducted for the International Congress "Save Food" at Interpack, Düsseldorf, Germany, 2011, p5.

gas releases directly affecting climate change. Use of artificial inputs, greenhouse systems in farming can be considered as the cause for damaging the ecosystem. Thus, inappropriate use of resources e.g. water use in agriculture is also under discussion. Several NGOs and international organizations underline the problem of unsustainability in conventional agriculture and look for more effective ways of food production. Sustainable ways to produce food with the minimum use of artificial inputs, local production, eco-friendly use of resources are mostly encouraged.

Table 1.1 Percentages of Food Losses and Waste in Turkey of Each Type of Product in Different Stages[4]

Product Type	% of Loss and Waste During Agricultural Production	% of Loss and Waste During Postharvest Handling and Storage	% of Loss and Waste During Processing and Packaging	% of Loss and Waste during Distribution	% of Loss and Waste during Consumption at Household Level
Cereal	5.1%	4%	2%	1%	5%
Roots and tubers	7%	6%	2%	3%	2%
Oilseeds and pulses	15%	5%	7%	1%	4%
Fruit and vegetables	20%	8%	10%	10%	5%
Meat	10%	0.2%	5%	0.5%	1%
Fish and seafood	10%	0.02%	0.04%	0.01%	2%
Milk	10%	1%	1.5%	6%	1.5%
Eggs	6%	1%	2%	1%	0.01%

[4] Source FAO, "Food Losses and Waste in Turkey Country Report", FAO Official Website: http://www.fao.org/3/a-au824e.pdf, 2013, p2.

Sustainability refers to "*keeping in existence, maintaining, prolonging*" (Hansen, 1996). The term is an adjective for economic growth, management, finance, development, agriculture to express their maintenance. The term appeals since the Industrial Revolution, the mankind has begun to question the continuity of its own race. Since the Industrial Revolution, mankind has become the strongest race in ecological chain with the power to manage all the systems; however, it has become weaker and in danger as a result of the excessive use of natural resources. In 1992, the first sustainability conference took place in Rio, and it was concluded that there would be no sustainable future in compliance with the extreme consumption of the natural resources. Kyoto and Paris agreements were about climate change and its negative impacts. Any temperature augmentation causes unusual patterns in weather conditions which is directly related to agricultural activities. Higher or colder temperatures may cause a rise in sea level, higher or lesser amount of rain, erosion in coastal areas, natural disasters (Mimura, 2013). Moreover, there is a concern about the biological reserves. As European Commission (2017) addresses, climate change effects could lead to higher temperatures, drought, desertification in Southern Europe, consequently there would be changes in arable lands. For instance, the lands for producing wheat may not be arable anymore as the weather and climate patterns have changed as he addresses.

Sustainable agriculture is a wide terminology that includes organic agriculture as it follows the same patterns including eco-friendly use of resources, concerning about biodiversity, quality of the land, animal welfare (Rehber and Grega, 2008). Both sustainable and organic agricultures have similar principles, closer objectives and organic agriculture is related to the mostly known and applied one in sustainable agriculture practices (Rigby and Cáceres, 2001). EU Regulation on Organic Farming imposes that organic agriculture must rely on renewable resources and highlights the importance of recycling to prevent losses and waste (The Council of European Union, 2007).

Organic agriculture corresponds to the principles of Good Agriculture Practices (GAP) and sustainability. FAO underlines the term of "Good Farming Activities" (GAP) as a wider term to define sustainable agricultural, post harvesting production

process aiming food safety and quality eco-friendly environment and healthy food (FAO, 2004). It is important to mention about organic by default, wild collected products having the same content with organic products. For instance, in India, 65% of agricultural lands is organic by default (Rehber, 2011). Wild collected and organic by default products are not certified. In Turkey, many producers who do not have the opportunity to get certification promote their products as organic but indeed they can refer to be organic by default production in compliance with consumer trust issue, however products without organic certification creates a dual understanding of organic products.

1.6.CRITICS OF ORGANIC AGRICULTURE

Organic agriculture is considered as the most spread one among sustainable production systems. On the one hand, the history and principles of the organic movement draw an idealistic, respectful portrait in terms of environment, health, benevolence aspects. On the other, there are several critics in terms of lower yields obtained from the organic production, capitalization of organic movement, health benefits and longer mileage of organic products.

Organic production is mostly criticized by its lower returns in yields unlike conventional production system. As mentioned before, the "Green Revolution" had achieved major developments by using high-yield varieties in Asia and Africa, as a result, the starvation had been prevented and social and economic developments have been successfully made with farmer ownerships, lower food prices (IFPRI, 2002). Critics express that organic agriculture is not suitable to obtain such high returns in yield (Kniss et al., 2016).

Another critic to organic agriculture is made on capitalization process of organic agriculture. Guthman (2000) expresses that some farmers apply multi-cropping instead of mono-cropping or fallow process in order to obtain higher level of production and harvest. Allen and Kovach (2000) point out that some organic farmers use external agricultural outputs. They also state that organic standards do not explicitly reflect the holistic approach of organic philosophy as they impose rules for a competitive market. Critics highlight that organic production has moved from a small, idealistic sector to a globally grown, a mainstream and more competitive one. Corporate farming companies have entered the organic food markets and this leads to a debate on capitalization of organic agriculture.

In terms of health and nutrition aspects, Maffei et al. (2016) express that the use of animal manure in organic agricultural practices increases the risk of enteric pathogenic microorganisms' contamination. An article released by Mayo Clinic discusses that there is limited information on benefits of organic food to draw general conclusions on overall health benefits (Mayo Clinic, 2018). Moreover, there are opponent views to organic production claiming that fresh conventional food products with lesser mileage – fresh products that are quickly sold in nearby the production place - have superior nutritional values than their organic counterparts. Desai and Riddlestone (2002) explain that along with lower nutritional value, the transportation cost of the organic food products causes higher energy consumption and contamination to environment. In these terms, long distance of transportation is also considered as a negative externality of organic agriculture.

1.7.THE SUPPLY OF ORGANIC FOOD

There is a growing rate in the number of organic producers worldwide. Regarding the growth in organic food market, we see that the supplier profile has become more corporate. Recently, many supermarkets, hypermarkets have opened sections for organic products and some launched their own private labels. In addition, farmers' markets and organic bazaars are taken under the support of NGOs for having equal, affordable prices and spaces.

Certified organic food products have high price premiums due to high production costs in comparison with conventional production system due labor intensity, low financial returns in the first years of harvest (conversion period), mandatory higher standards of animal welfare, medical expenses, lesser economies of scale, high transportation and processing costs caused by the segregation of organic and conventional products, marketing at a lesser extent and small volume of sales as FAO explains (FAO, 2018c). Similar to production process, the distribution of organic products may also be costly.

This section intends to explain organic production process, supply chain and constraints and entry barriers in organic food market briefly. In chapter 3, we will reveal the existing literature on organic food supply in more details.

1.7.1. Organic Food Production Process

Land is a primary component of any farming process just like the organic production system. Organic production system begins with "conversion period" which means the transition period to organic production. IFOAM and International Basic

Standards (IBS) express the conversion period as "*the time between the beginning of organic management and the certification of crops and animal husbandry as organic"* (IFOAM, 2006). The length of conversion period may differ in accordance with countries' standards and regulations and crop type, approximately the time for the conversion accounts for 3 years. FAO, WHO express in Codex Alimentarius guidelines that the minimum required period to convert to organic production is 2 years before annually harvested crops can be certified and 3 years for perennial crops (FAO/WHO, 2005). Governments explicitly clarify the organic production system requirements in their organic legislations and acts. Even though there are some constraints that organic producers face such us the length of the duration of fallow and soil nurture, there is a growing development in the conversion to organic agricultural lands.

In the organic production, organic standards are reference points. They explicitly define the practical and technical requirements in organic production and guide the producers. The certification in accordance with organic standards is a procedure which guarantees organic products in compliance with the production under certain standards (IFOAM, 2018b). Both agricultural raw and processed food products must be certified by a control and certification body that is accredited by the government. Control and certification bodies control, inspect, assess and analyze the land and product, then certify the producers and handlers. The process for organic certification have similar rules and standards in many countries as before conversion, the producer should represent required documentation and records on livestock or crops to the control and certification body. Control and certification bodies make contracts with producers and charge certification fee. IFOAM explains that group of producers may apply to a group certification in which producers implement an Internal Control System (ICS) and they are certified collectively. There are many control and certification bodies worldwide, and most of them are private ones. The most applied standards will be discussed in the following section.

1.7.2. Supply Chain in the Organic Food Market

1.7.2.1.Direct Channel

A direct channel as a distribution system constructs a mechanism such that the producer and the consumer of a product have one to one interaction. In direct channel, the sale activity may happen face-to-face, online, or the seller may be the producer itself. In other sense, it can be defined as a distribution system from seller who produces the product at first hand to the ultimate buyer who consumes the product. Farmers' market is an example of a direct channel where the consumer may detect the products and producers by him/herself. Similar to farmers' market, organic bazaars are also another direct channel examples where producers directly meet the consumers.

There are lots of advantages in direct channel. Skulskis, and Girgždienė (2013) express that this sale activity interrelates producers and consumers, helps to form a widen knowledge of consumers upon organic food quality. They also found that young consumers have more trust in specialized farmers' market while purchasing organic food products. Hamzaoui-Essoussi and Zahaf (2008a) define community organic consumers who buy regularly organic food products and prefer direct channels due to their need to buy directly from farmers and build a strong trust relationship, and minimize the food mileage. Figure 1.2 shows direct channel in organic food supply.

1.7.2.2.Indirect Channel

Since the organic food market has moved from a niche market to a widely spread one, more intermediaries and chains are involved in the supply chain. As it is shown in Figure 1.2, indirect channel is the chain where the producer sells the products to retailers through a wholesaler or a distributor. Hamzaoui-Essoussi and Zahaf (2012) express the entry of wholesalers into the organic food supply chain as a result of the growth of the market; retailers require larger amounts of organic food products in accordance with the increasing demand. Dovleac (2016) addresses that retailers are the last step in the supply chain of organic products and they make a close relationship with consumers. From another point of view, Technavio (2016) claims that the

competition in the organic food market will be highly intense by 2020 as more retailers will come up marketing their own organic labels.

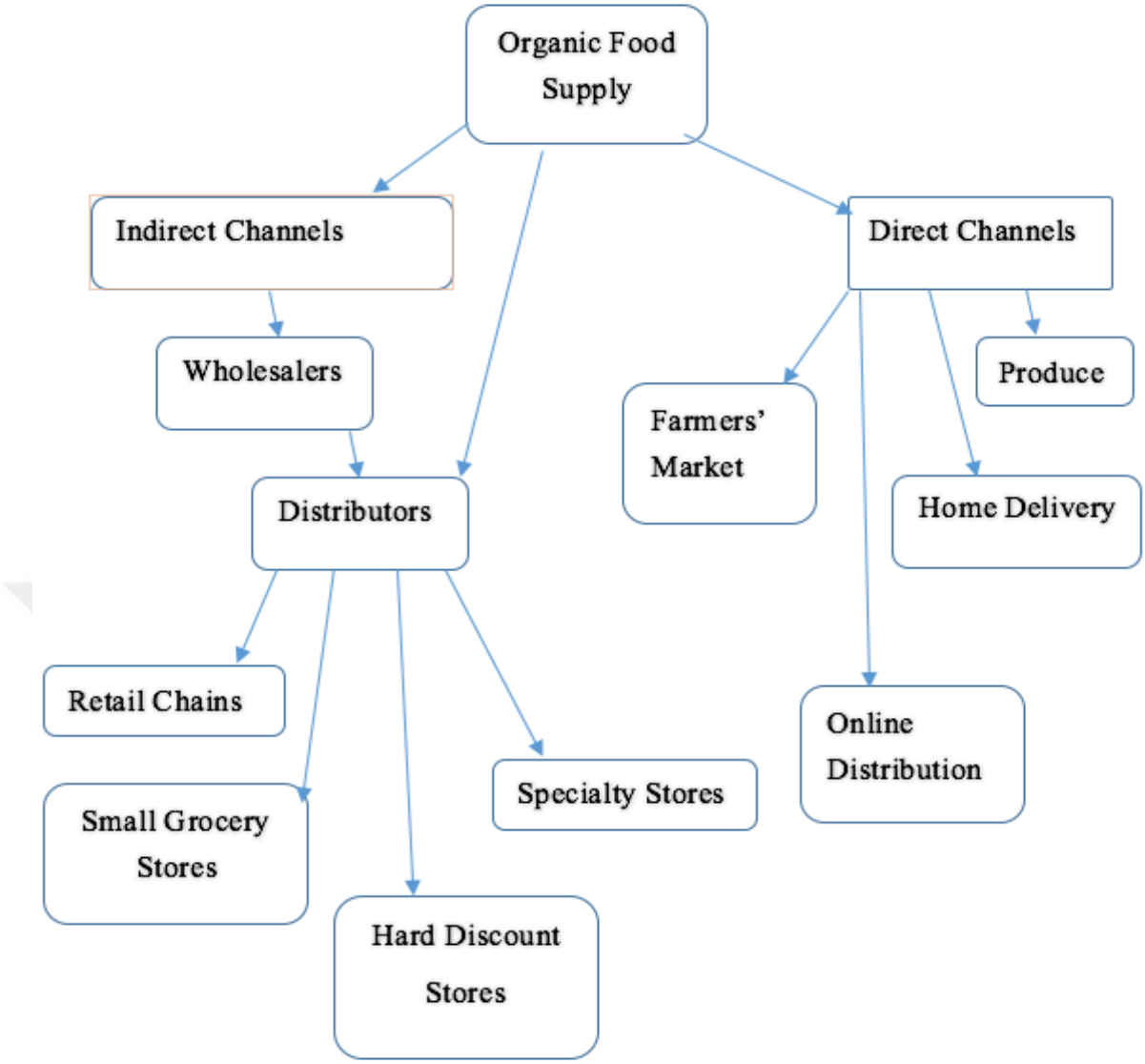

Figure 1. 1 Organic Food Supply Channels[5]

[5] Source: Leila Hamzaoui-Essoussi and Mehdi Zahaf, "The Organic Food Market: Opportunities and Challenges**" Organic Food and Agriculture - New Trends and Developments in the Social Sciences.**2012, p10**.**

1.7.3. Constraints and Entry Barriers in the Organic Food Market

The organic food market has been a mainstream sector worldwide, however there are some constraints and entry barriers in this sector. This section will briefly reveal constraints and entry barriers on the supply side; a wider literature review will be provided in Chapters 3 and 4.

High production costs not only limit the entry to organic food market but also the growth in the supply side. Control and certification processes are important parts in the organic production as it is a way to signal authenticity and quality of organic products. The certification cost and the duration of the process such as extra paper works can be considered as constraints. Besides, like all food products, organic food products are included in the food codex. This ensures that organic food products must be monitored and qualified twice. Double monitoring is surely a benefit and a necessity for consumer health and trust; but the complexity of the double standardization can be an entry barrier for producers.

The size of the land and its location can be a constraint. Closer locations of organic production establishments -most specifically farms- to conventional production areas may increase the risk of contamination. In addition, by inheritance, the lands are divided in small parcels and it is difficult to establish an extensive production area and the yield growth rate remains low in the first 3 years of harvest and it can be dissuasive for producers.

The organic agriculture needs an important amount of labor. As the organic production is an information-based system, the need of qualified labor and the training process can also be costly for producers, thus it can become an entry barrier. Unfortunately, in Turkey, qualified labor in organic agriculture is rare, the education on organic agriculture is provided in vocational schools. Graduates from organic agriculture departments of vocational schools do not have license and eligibility to work as technicians, controllers in the organic food market. In addition to this, insufficient R&D opportunities in terms of existence of accredited laboratories can also be considered an important constraint (Bayram et al., 2007; Demiryürek, 2011).

Attitudes of producers and their unwillingness to convert to organic agriculture can be considered as constraints in the market. In general, environmental and health concerns can be a driving force for the conversion and economic incentives such as obtaining price premium, earning higher yields can be motives. In case with the lack of knowledge and information on these motives, producers may be unwilling to invest in organic production and it can affect the growth of the market negatively. Furthermore, social stigma to change the production system, risk averseness to implement new production methods are also important constraints (Strochlic and Sierra, 2007).

Demand side constraints are also important problems in the growth of organic food market. Mistrust, misinformation on organic food products may decrease the demand and may discourage farmers and other parties in the organic supply chain to convert to organic agriculture. Another important constraint on the demand side is the expensiveness of organic products in general. Organic products have around 20% more price premium than their conventional counterparts. With the lack of knowledge, trust and information on organic products and their production process, consumer willingness to pay for organic products will be lower. In addition, asymmetric information may cause market failure in this sector. As it will be discussed later, moral hazard problems such as fraudulent actions may deteriorate consumer trust and the competition on the supply side (Ersun and Arslan, 2011).

Organic production systems also have high distribution and marketing costs. In terms of retail and transportation costs, organic products have higher expenses than conventional ones. The economies of scale remain small, and the mileage of products are longer in the distribution and transportation of the organic products. Strict rules and standards for the storage and packaging process lead to higher costs as well. Moreover, as the distribution of retailers has been more dominant in the supply chain, extra retailing costs in terms of shelf rents and storage are other constraints in the market. Since the demand for organic is lower than conventional one, organic products stay at shelfs much longer than their conventional counterparts. For this reason, the pricing of the shelf rent can be higher for organic producers and may become an entry barrier. For specialty shops, as they have higher costs in accordance with lower

economies of scale -high rent of the shops, costs of transporting, storage etc.- the prices are generally higher than supermarkets. As explained earlier, big retailers enter the organic food sector under their own organic labels and they have an advantage of shelf space and this situation may lead an unfair competition.

From an institutional perspective, inefficient NGOs and government supports may discourage producers to convert to organic agriculture (Constance and Choi, 2010). Incentives and policies are criticized in terms of the lack of support for education, NGOs, coordination between institutional bodies and producers, unionizing, R&D, finance, broadcasting, pilot projects, promoting livestock and aquaculture production in exports, simplification of control and certification legislation in compliance with the EU in Turkey (Demiryürek, 2011).

The use of labels such as “natural”, “from the village”, “pure”, “additive free” can lead to consumer misperception. Manipulations under these names, promoting the products as organic but not following any organic standards harm the competition in organic food market.

1.8.THE DEMAND FOR ORGANIC FOOD

Organic food demand has an increasing trend given consumers' interest. As a reaction to incidents like mad cow diseases, pesticide residues, over use of antibiotics in livestock, unsustainability in ecological cycle and use of natural resources, climate change, discussions on GMOs and their effect on health and biodiversity; consumers have been becoming more concerned about health, environment, animal welfare, sustainability. Conventional products are more questioned with regard to these problems. Consumers look for more secure and qualified food products and they need to detect or recognize signals to see evidence for food safety and quality.

Organic food production offers food safety and high quality in products as they are inspected in the production process and acquire certification as a proof of the organic authenticity. In demand side, there are several motives to push consumers to buy organic products, whereas there are constraints preventing the growth of organic demand. This section will briefly reveal motives and constraints in the demand side, in Chapter 2 we will discuss the organic food demand in Turkey with a widely explanation of recent studies in the literature.

Health is an important motive for organic food consumers. Discussion on impacts of pesticide use and residues in food products, the growth in number of diseases like cancer, obesity, diabetes lead individuals to healthy life styles (WHO, 2018b; Mie et al., 2018; Jamison, 2006). Regarding the principles of organic productions as it prohibits to use of pesticide, antibiotics, chemically synthesized inputs; organic food products offer a risk-reduced food in these terms.

Environment concerns also direct consumers to look for alternative products rather than conventional produces. Climate change impacts and reports of international

institutions like FAO has generated an awareness in environmental issues and knowledge on the positive contribution of organic agriculture on the ecosystem (Scialabba and Müller-Lindenlauf, 2010).

Nutrition is a basic trigger in food consumption; consumer interest on products that are richer in nutritional values has been rising. Not only in terms of vitamin content, but also no contain of chemical drug, GMOs are also positive aspects of organic food product in nutritional side.

Sensory factors affect consumer preferences in organic food purchase. Taste is an important motive in organic food consumption, consumers have a tendency to identify organic food products with a better taste than their conventional counterparts. Freshness is another important characteristic; organic products tend to be considered fresher as they do not contain chemical preservatives to extend their shelf life. On the other hand, appearance can be seen as a constraint in organic food demand due to defected appearance of organic food products. Shelf life is shorter due to the absence of any preservatives for longer shelf duration, which can be assumed as a disadvantage in the organic food demand.

Another major constraint in the purchase of organic food products is the lack of consumer knowledge and information. Consumers who are less informed on positive contributions of organic agriculture and advantages of organic food consumption may be reluctant or unwilling to purchase organic food. The lack of knowledge on production process, logo, certification of organic products may also discourage consumers to buy organic. Since organic food market has been a developing sector, the production volume is lesser than conventional products and the lack of availability of organic food products may be problematic.

Expensiveness may be another constraint that can lead consumers not to buy organic food. Referring to expensiveness and price premiums, income is also an important component in buying decisions. Consumer willingness to pay also plays an

important role in the decision making of food purchase. These motives and constraints will be explained and discussed in detail in Chapter 2.

1.9.DEVELOPMENT OF ORGANIC FOOD MARKET IN THE WORLD

1.9.1. Outlook to Organic Agriculture

Organic agriculture has first started in Northern Europe and the United States and then spread to other countries. In 2016, 178 countries practice organic agriculture and 87 of them have their national organic regulation. The total organic agricultural land is 57.8 Million hectares compared to 11 Million hectares in 1999. It is important to note that from 2015 to 2016 the increase in the share of total organic land in the world is 15% (a year); and from 2007 to 2016, it is 83.5% (ten years). Australia is the leading country with the largest organic land (27.1 Million hectares) followed by Argentina (3.0 Million hectares) and China (2.3 Million hectares). Figures 1.3 and 1.4 show the detailed statistics on organic agricultural land in the world.

The share of organic land in total agricultural land is 1.4% worldwide, whilst Liechtenstein has the highest share with 37.7%. Among 178 countries that practice organic agriculture, only 15 countries have the share for organic agricultural land higher than 10% where 96 countries have less than 1%. Figure 1.5 demonstrates the growth of organic agricultural land and its share between 1999 and 2016. As shown, the share of organic agricultural lands rises from 0.3% to 1.4% in 2016. Besides, Oceania has the sharpest increase in organic agricultural land where Africa has the lowest increase (Figure 1.6). As Figure 1.7 demonstrates, 59% of organic lands in the world is agricultural lands and crops, whereas 40% is wild collection. In Figure 1.8, the top 10 countries with highest increase in organic land are shown. Australia is the leading country with more than 5 Million hectares in 2016.

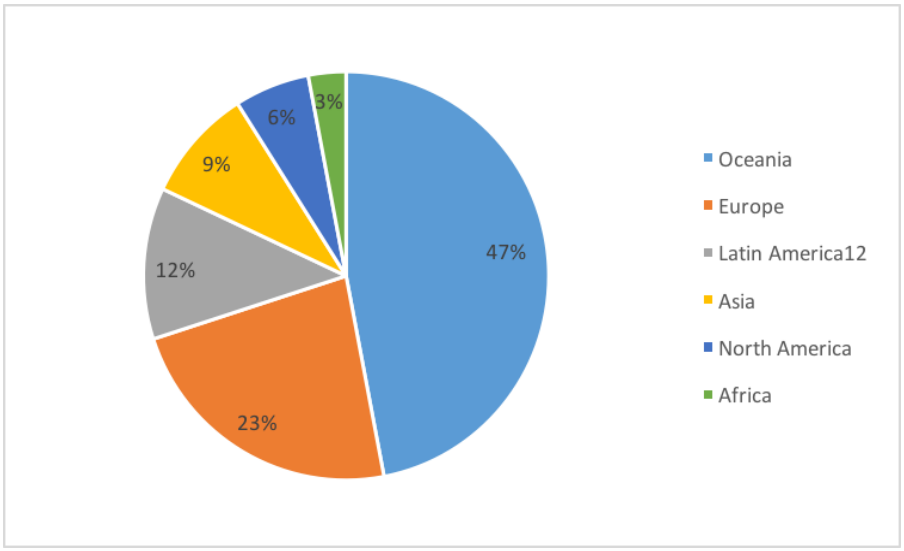

Figure 1. 2 Distribution of Organic Agricultural Land by Region 2016[6]

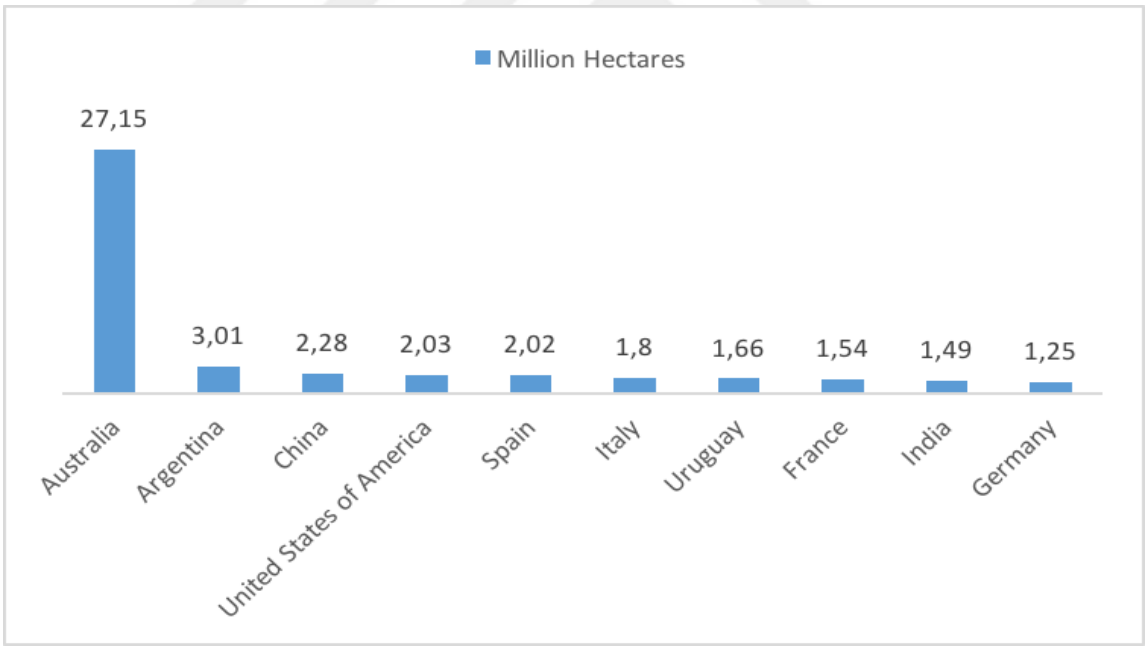

Figure 1. 3 Top 10 Countries with the Largest Organic Land in the World[7]

[6] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 250.
[7] Ibid, p 228.

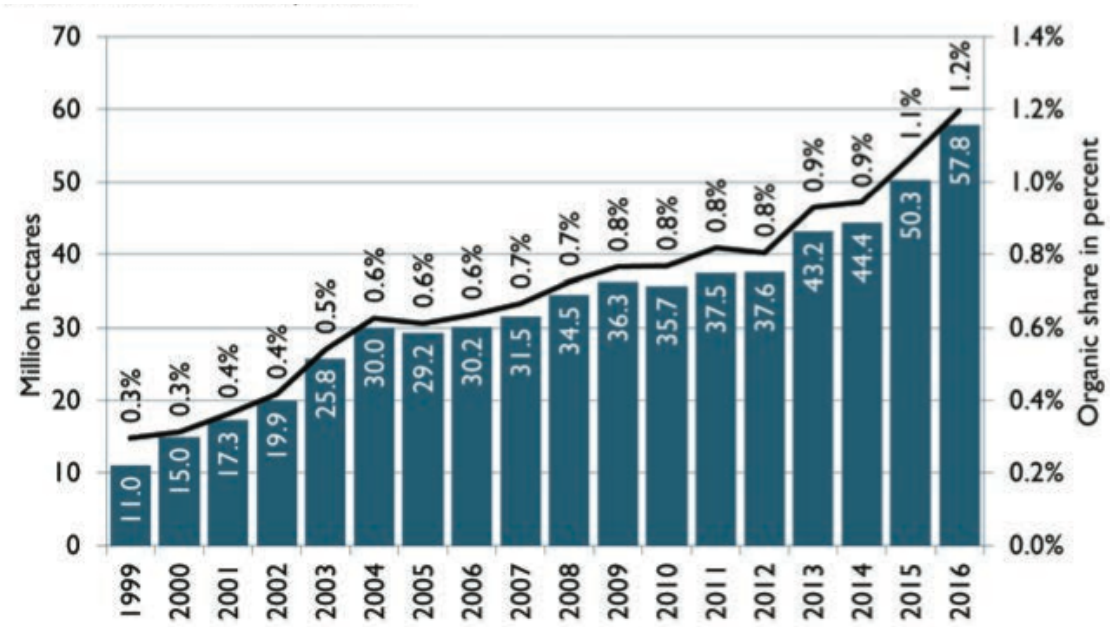

Figure 1.4 Growth of the Organic Agricultural Land and Organic Share in the World[8]

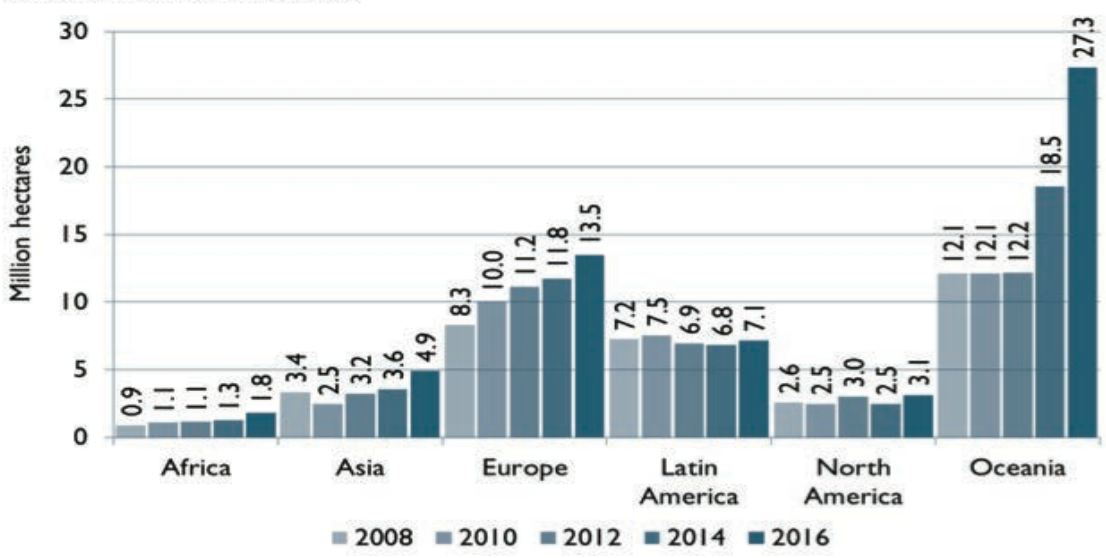

Figure 1.5 Growth of Organic Agricultural Lands by Continent 2008-2016[9]

[8]Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 47

[9] Ibid, p 42.

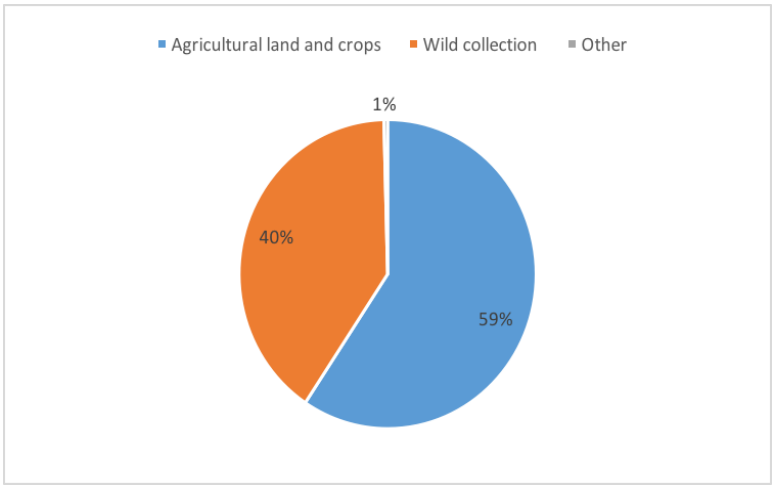

Figure 1. 6 Distribution of Organic Lands in the World[10]

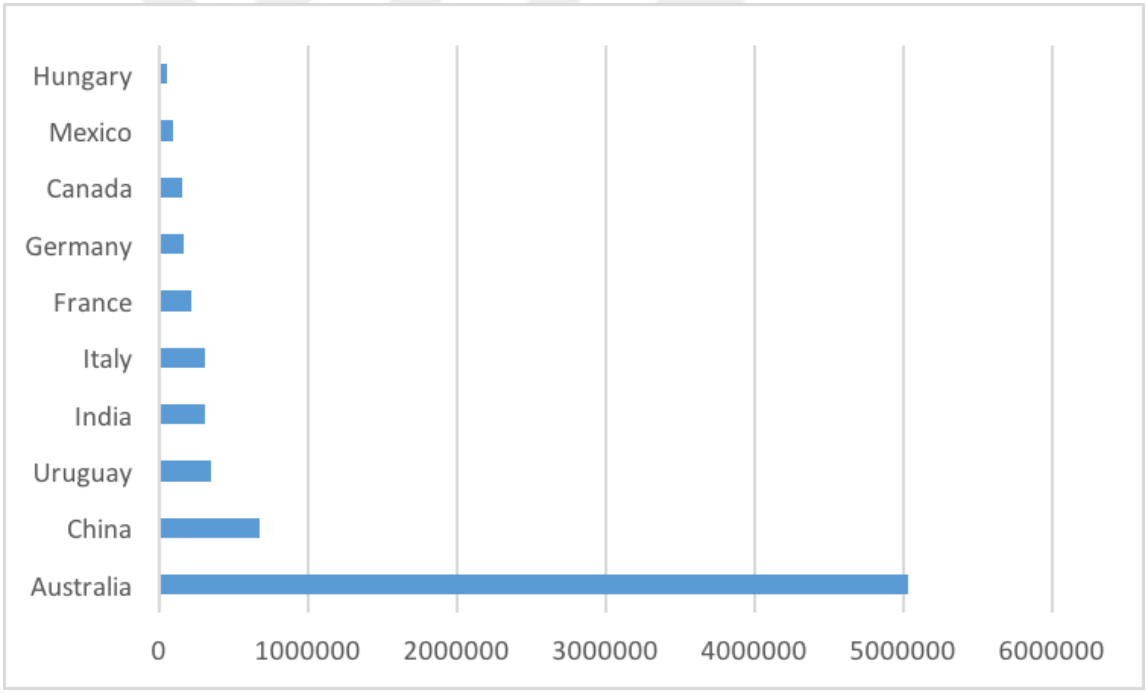

Figure 1.7 Top 10 Countries with the Highest Increase in Organic Land 2016 (in Hectares)[11]

[10] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 46.
[11] Ibid, p 39.

The total number of organic producers has increased from 200,000 to 2.7 Million from 1999 to 2016. From 2015 to 2016, the number is raised to 2.7 Million from 2.4 Million with a growth rate of 12.5% whilst the growth rate is 370% between 2007-2016. Asia along with the Africa and Latin America have 75% of all producers in the world. Only 14% of organic producers are in Europe and 1% are in North America. In Asia, the growth rate of organic producers is 30% from 2015 to 2016, whilst the 10-year growth rate (2007-2016) is 370.6%. India is ranked as 1st with 835000 producers followed by Uganda and Mexico with approximately 210,000 producers. Figure 1.9 shows top 10 countries with the largest organic producer number. Furthermore, there are 81144 organic processors, 5171 organic importers and 6401 organic exporters worldwide as of 2016.

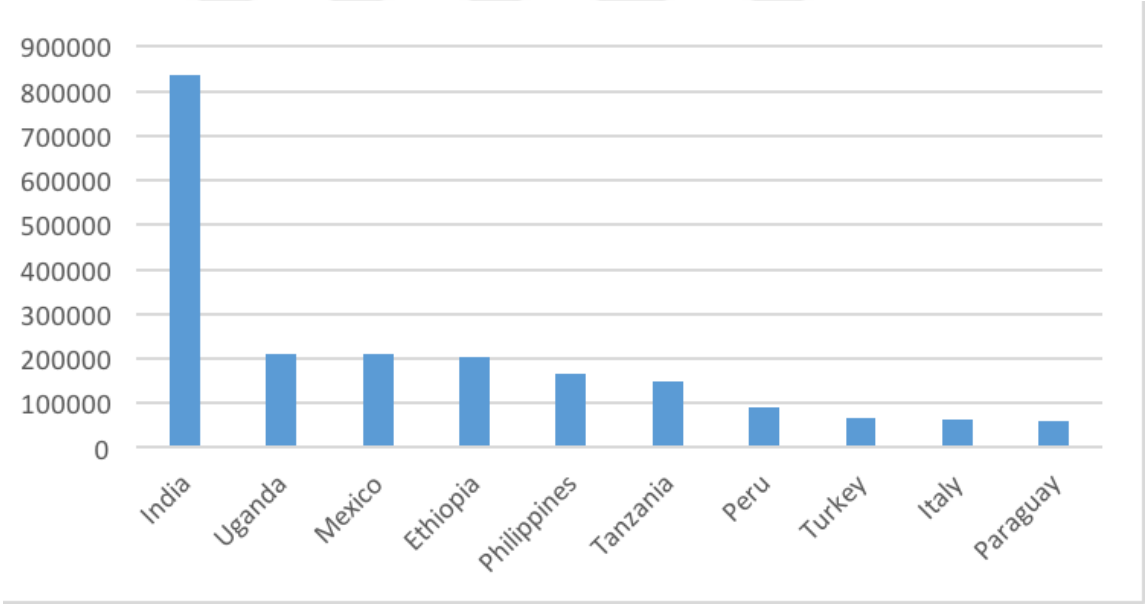

Figure 1.8 Top 10 Countries with the Largest Number of Organic Producers in 2016[12]

[10] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 61.

The land use type is crucial in agricultural practices. Arable land refers to the land under temporary agricultural crops (multiple-cropped areas are counted only once), temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallowed (less than five years). The abandoned land resulting from shifting cultivation is not included in this category. Whereas permanent crops, the land cultivated with long-term crops do not have to be replanted for several years such as cocoa and coffee, land under trees and shrubs producing flowers; roses and jasmine; and nurseries[13]. Also, permanent grasslands are excluded from the land under permanent crops. Permanent grassland is the land used permanently (five years or more) to grow herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land). In this context, Figures 1.10 and 1.11 indicate the type of the organic land use by region, organic crop categories and their shares. Oceania has the largest permanent organic grasslands, whereas Africa has the most permanent organic crops and Asia has the largest arable organic land crops. Besides, it is shown that more than half of the organic land is permanent grassland, whereas arable organic land crops consist of almost $1/5^{th}$ of organic land. Also, the most important arable organic crop category is cereals with 4,091,183 Hectares. In Figure 1.11 there is a detailed information about sub-types of each organic crops.

[13] Except those for forest trees, which should be classified under "forest".

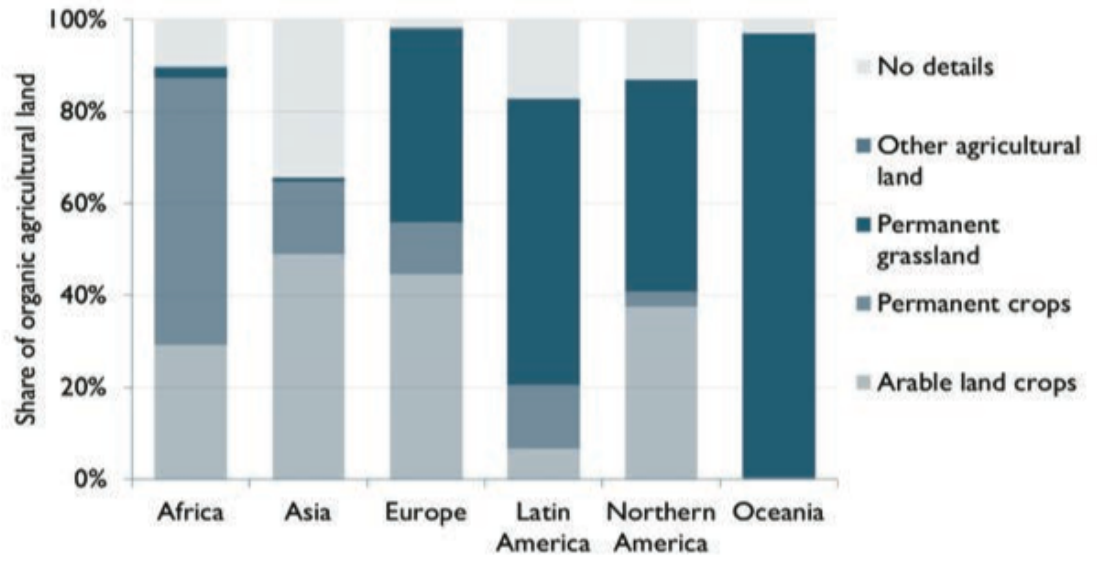

Figure 1.9 Distribution of Main Organic Land Use Types by Region 2016[14]

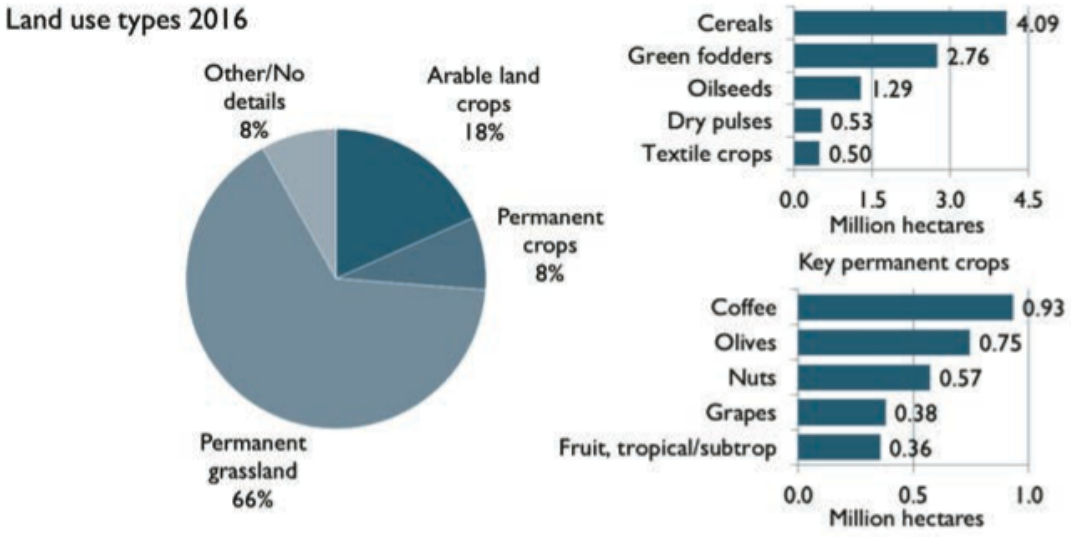

Figure 1.10 Distribution of the Main Organic Land Use Types and Crop Categories, 2016[15]

[12] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 75.
[15]Ibid, p 76.

Figure 1.12 shows the development of the organic land by land use type between 2004 and 2016. It is seen that permanent grassland has a tremendous increase since 2012; and from 2013, the growth rate in permanent grassland is approximately 50%. Similarly, permanent crops have been increased by 17%, where arable crops are increased by 2%.

This section aims to provide important statistics on organic agriculture worldwide. Since EU and US are the two most developed single markets in organic food sector worldwide, we will also reveal their statistics.

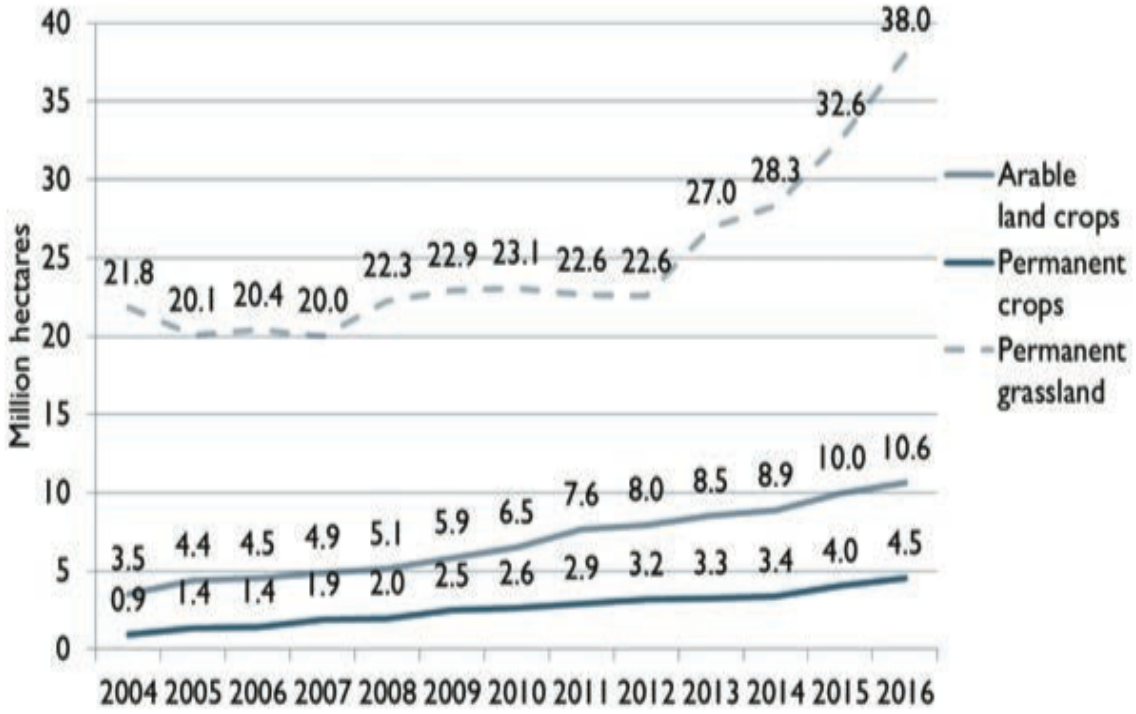

Figure 1.11 Development of the Organic Land by Use Type 2004-2016[16]

[16] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 76.

1.9.1.1.Outlook to Organic Agriculture in US

In US and Canada, total organic agricultural area is approximately 3 Million hectares. US has 2.03 Million Hectares organic lands, which corresponds to 0.6% of its total agricultural land. Besides, Canada has 1.09 Million Hectares and it is almost 1.7% of its total agriculture land (FIBL and IFOAM, 2018) .

USDA (2016b) reports a significant increase in the number of certified organic operations with a continuing trend of double-digit growth in the organic sector. The report states that according to Agricultural Marketing Service's (AMS) National Organic Program (NOP) data, there are 21781 certified organic operations in US and 31160 around the world. Moreover, it states that the number of domestic certified organic operations has increased by almost 12% between 2014 and 2015, representing the highest growth rate since 2008; which corresponds to an increase of nearly 300% from 2002.

The number of exported organic products has risen from 23 to 33, whereas that of imported organic products has increased from 16 to 31 between 2011 and 2016 in US. Besides US organic imports has reached to 1.7 Billion USD in 2016. The most imported organic products include banana, coffee, and olive oil (US does not produce in large quantities of these products), as well as corn and soybeans (to meet growing demand for organic livestock feed). Turkey, Mexico, Italy, Peru, and Ecuador supply 43% of tracked US organic imports. In 2016, 87 countries exported organic products to US (USDA, 2017). In accordance with the data provided by OTA (2017), imported organic coffee has approximately 314,000 USD value and it corresponds to nearly $1/5^{th}$ of the US organic imports. Soybeans and bananas have reached 250000 and 209000 USD value respectively. These three products account for nearly half of the organic imports in US.

In US, exported organic food products mostly consist of fruits and vegetables and their value has reached 548 Million USD in 2016 as USDA reports. The majority of these products are apples, grapes, and lettuce. Besides, US exports organic products to 79 countries and the exported products to Canada and Mexico account for 70% of

the value of tracked US organic exports in 2016. Japan, Taiwan, and South Korea are also important trade partners for organic products in 2016 (USDA, 2017). OTA (2017) expresses that organic apple exported from US accounts approximately for nearly 1/7th of the US's organic exports. Organic apple, lettuce and grapes are nearly equivalent to half of the export of organic products (OTA, 2017).

1.9.1.2.Outlook to Organic Agriculture in Europe and EU

In Europe, there are 13.5 Million Hectares, and EU has 12.1 Million Hectares of organic farmland in 2016. The shares of organic farmlands in total agricultural lands in EU and Europe are 6.7% and 2.7%, respectively. From 2007 to 2016, organic farmlands grew by 68% both in EU and Europe. With 2 Million Hectares, Spain is ranked 1st with the largest organic farmland, followed by Italy and France (FIBL and IFOAM, 2018). In Figures 1.13 and 1.14, the distributions of organic farmland by country in both Europe and EU are exhibited.

Liechtenstein has the highest share of organic farmland of the total agricultural lands with the share of 37.7% in Europe and worldwide, and Austria has the highest share (21.9%) in EU. Figure 1.15 demonstrates the share of organic lands in European countries. There are 370000 organic producers in Europe and 300000 in EU. In 2016, Turkey has the largest number of organic producers in Europe (around 68000 as of 2016). Between 2007 and 2016, the growth in the number of organic producers is 76% in Europe and 58% in EU. In Europe, there are 66000 organic processors and almost 63000 of them are located in EU. Italy is the leading country with 17000 processors, and Germany has the highest number of organic importers with a number of 1600. The number of organic importers is around 4700 in Europe and 4000 in EU (FIBL and IFOAM, 2018).

International trade of organic products is an important issue in EU. As European Commission clarifies, EU mostly imports coffee from Brazil, kiwi fruit from New Zealand, rice from Thailand, bananas from Costa Rica, cocoa from Peru, pineapples from Uganda (European Commission, 2018).

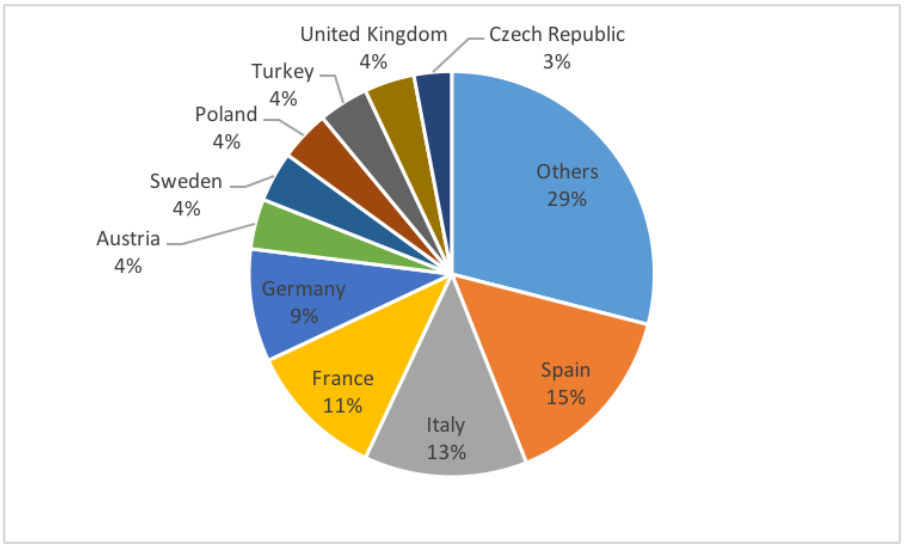

Figure 1.12 Distribution of Organic Farmland by Country in Europe, 2016[17]

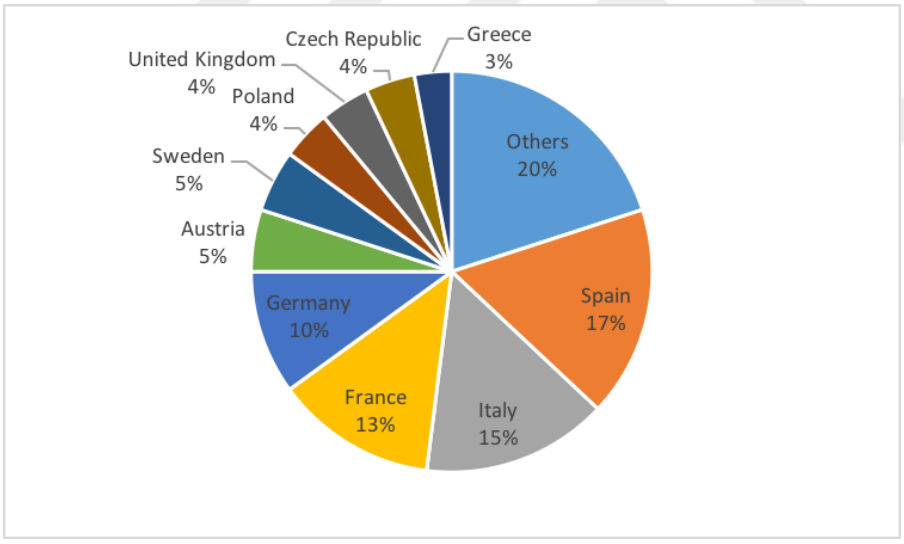

Figure 1.13 Distribution of Organic Farmland by Country in EU, 2016[18]

[17] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 220
[18] Ibid.

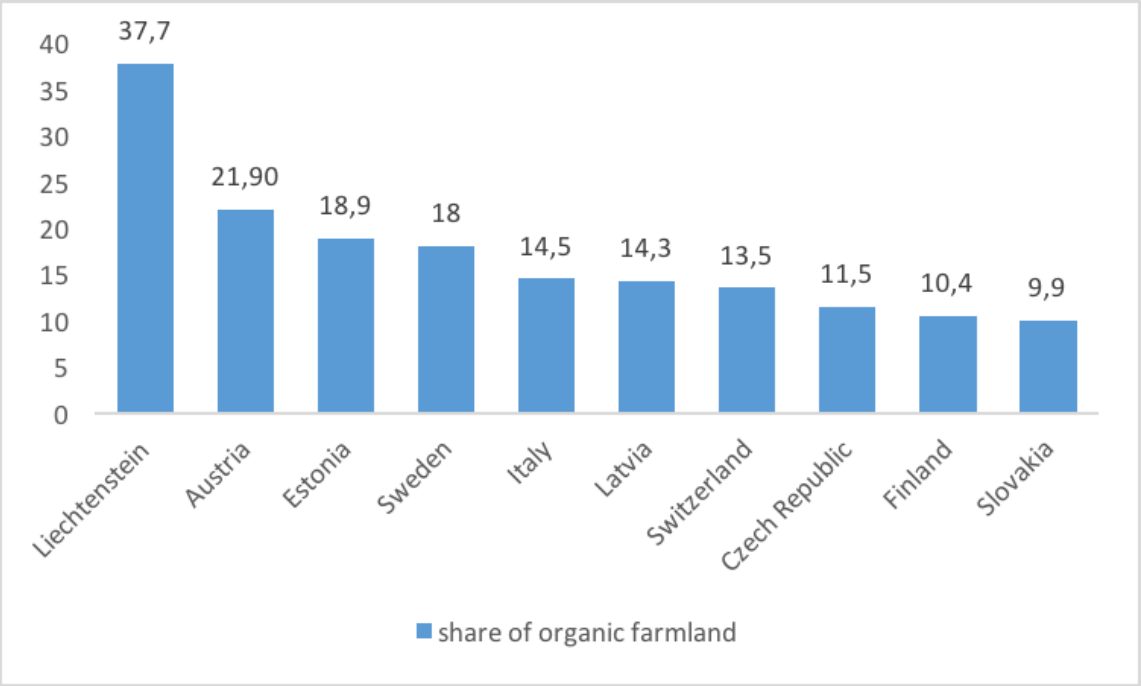

Figure 1.14 Top 10 Countries with the Highest Share of Organic Farmlands in Europe[19]

1.9.2. Outlook to Organic Livestock Production

Organic agriculture is growing in the world and every year more countries participate in organic farming. In terms of animal products, which have an important place in the food chain, the use of organic production methods is becoming increasingly widespread consequently. As shown previously, the share of total permanent organic grassland is 66% of the total organic agricultural lands in the world and it shows the importance of organic livestock production in organic agriculture, as the pasture is the main component for livestock and feedstuff production. As the FIBL and IFOAM Report (2018) states, the data for organic livestock production is not available for many countries. For this reason, this section will present current available statistics on organic livestock production in US, Europe and EU.

[19] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 223.

1.9.2.1.Outlook to Organic Livestock Production in US

Organic livestock production has an increasing trend in US. Organic meat production is regulated and standardized by USDA implementations since 2002. As of 2016, there are 2.3 Million acres of organic certified rangeland and 46,014 organically certified beef cows. There is a high price premium, approximately 67% of the price of conventional meat. Most of the organic beef producers operate diversified farms and ranches. Poultry accounts for the largest volume in organic meat sales and chicken is the most available product type. The price premium for organic chicken is relatively low compared with organic beef and pork as its production has a short cycle. Table 1.2 shows the number of organic livestock per head and their sales value in USD; it is seen that mostly produced and sold organic livestock product is broilers.

Table 1.2 Organic Livestock Inventory and Sales Value in US, 2016[20]

Type of organic livestock	Head Number	Sales Value in USD
Milk Cow	267,523	57,801,387
Beef Cow	42,554	10,531,380
Hog and Pigs	14,707	6,891,039
Sheep and Lambs	9,446	1,199,815
Goats and Kids	3,609	227,551
Other Livestock		656,340
Chicken-Layers	15,475,570	2,462,123
Chicken-Broilers	19,437,579	749,929,661
Turkey	410,711	83,129,395
Other Poultry		79,265,683

[20] Source: It is listed from the data provided by USDA, "Certified Organic Survey 2016 Summary", US: USDA, 2017.

1.9.2.2.Outlook to Organic Livestock Production in Europe and EU

Similar to the remarkable trend in organic food market in the world, the organic livestock production has been growing in EU as well. Since there are differences in terms of climate, history and economic factors, candidate and member countries are differentiated from each other (Roderick et al., 2006).

Table 1.3 demonstrates the number and shares of organic livestock in total livestock production both in Europe and EU. The share of each organic livestock category is quite small. Organic bovine animals and sheep have each 3% share in total livestock production. Organic poultry share remains at 1.6%. The reason for the small shares of organic poultry and pigs can be due to the lack of supply in organic feedstuff, difficulties in traceable certified organic feed imports, high investments in organic pigs and high price premiums (FIBL and IFOAM, 2018). In terms of one-year growth between 2015 and 2016, the shares in these livestock types have increased 6% each. When 10-year growth is analyzed, organic poultry has developed by 131% due to high demand in eggs, where bovine animals share have increased by 68%. In EU, organic bovine animals and sheep have the highest shares among organic livestock with 4.5% each; whereas organic poultry has 3.1%.

According to FIBL and IFOAM Report (2018), the reason behind the highest shares of these products is that the conversion to a more extensive production is simpler. While comparing the head number in Europe and EU, it is seen that the majority of organic livestock are located in EU. For bovine animals, France has the highest number followed by Germany and Austria. Similar to organic land share, Liechtenstein has the highest share with 26% in organic livestock, followed by Latvia and Austria. UK has the highest number of organically grown sheep, followed by Italy; whereas Estonia and Czech Republic have the highest organic share of sheep with 47% and 46%, respectively. In terms of head number of organically grown pigs, Germany, Denmark and France are the leading countries. FIBL and IFOAM Report (2018) also states that the data for organic poultry is unspecific due to unclearness in countries' data. While looking into organic milk from cows, the production has doubled from 2007.

Table 1.3 Organic Livestock Statistics in Europe and EU, 2016[21]

	Europe				EU	
Livestock Type	**Head Number**	**Organic Share (%)**	**Change 2015-2016 (%)**	**Change 2007-2016 (%)**	**Head Number**	**Organic Share (%)**
Bovine Animals	3,857,782	3.0%	6.0%	68%	3,642,372	4.5%
Sheep	4,591,943	3.0%	-1.0%	34%	4,365,188	4.5%
Pigs	992,752	0.6%	6.0%	55%	963,221	0.7%
Poultry	45,639,898	1.8%	11%	131%	43,262,652	3.1%

1.9.3. Outlook to Organic Aquaculture and Beekeeping

The available data for organic aquaculture and beekeeping is limited. As of 2016, total area for organic aquaculture is 71972 Hectares with more than 400000 metric tons of production in worldwide. Organic aquaculture was firstly included in organic certification in 1995 (Potts et al. 2016). Asia has the highest share in organic aquaculture with 77% where China is the main contributor as it has more than 300000 metric tons of production; followed by Europe (22%) where Ireland and Norway are the major producers (Figures 1.16 and 1.17). Between 2015 and 2016, organic aquaculture production has risen by 8%. It is also important to mention about the lack of data of large organic aquaculture producers such as Brazil, Indonesia, Vietnam and Thailand. In terms of species, organic salmon is mostly produced with approximately 40000 metric tons, followed by mussels with 19000 metric tons. Almost 83% of organic aquaculture has no details on species (FIBL and IFOAM, 2018).

[21] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 233.

Similarly, the data for organic beehives is limited in many countries. As of 2016, organic beehives account for 2.1 Million, which is approximately 2.4% of the total beehives in the world. As Figure 1.18 demonstrates, 46% of organic beehives are in Latin America, followed by Europe with a share of 42%. Brazil, Mexico and Bulgaria have the most organic beehives in the world, respectively. During 2007-2016, the number of organic beehives has increased more than 1.5 Million as Figure 1.19 shows; the increase between 2014 and 2015 is due to additional data provided by countries like Brazil. Referring to high growth in beehives, organic beekeeping has a potential in the future. Complexity in conversion period, the lack of knowledge, and controlling Varroa parasite in organic apicultural production are some constraints that can limit the organic beekeeping activities (FIBL and IFOAM, 2018).

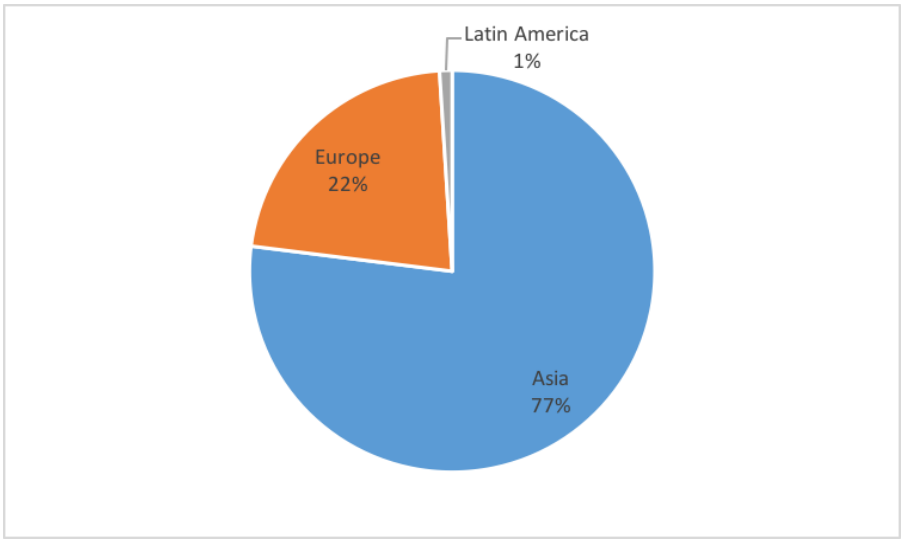

Figure 1.15. Distribution of Organic Aquaculture Volume by Region, 2016[22]

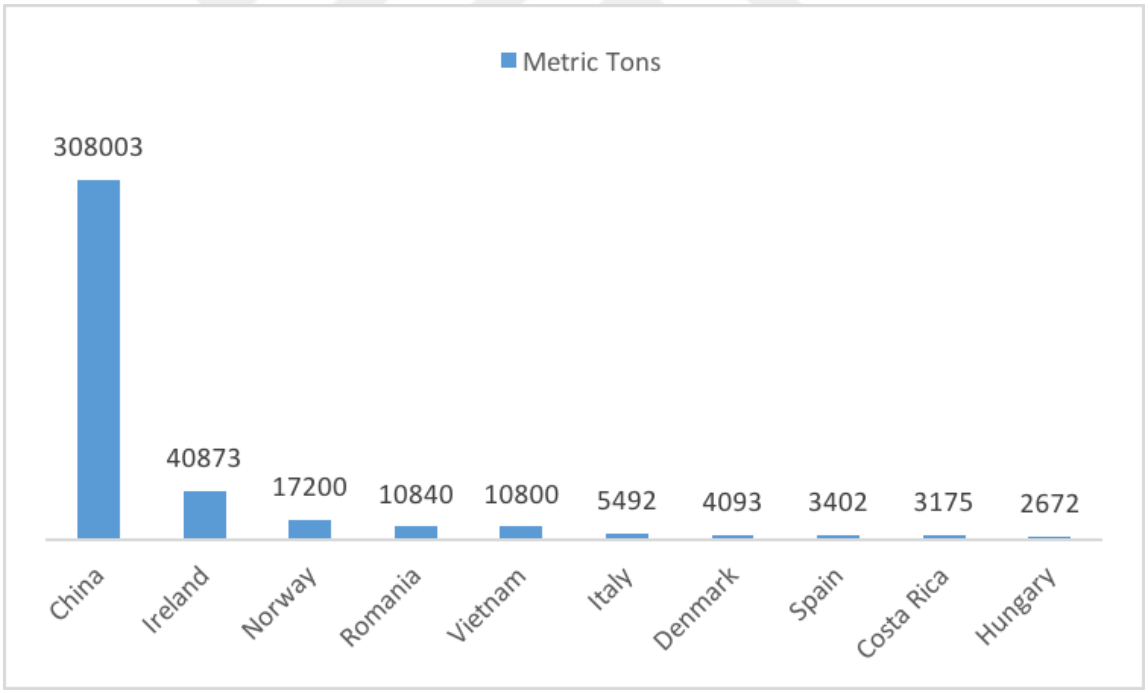

Figure 1.16. The Top 10 Countries with the Largest Organic Aquaculture Volume, 2016[23]

[22] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 90.
[23] Ibid.

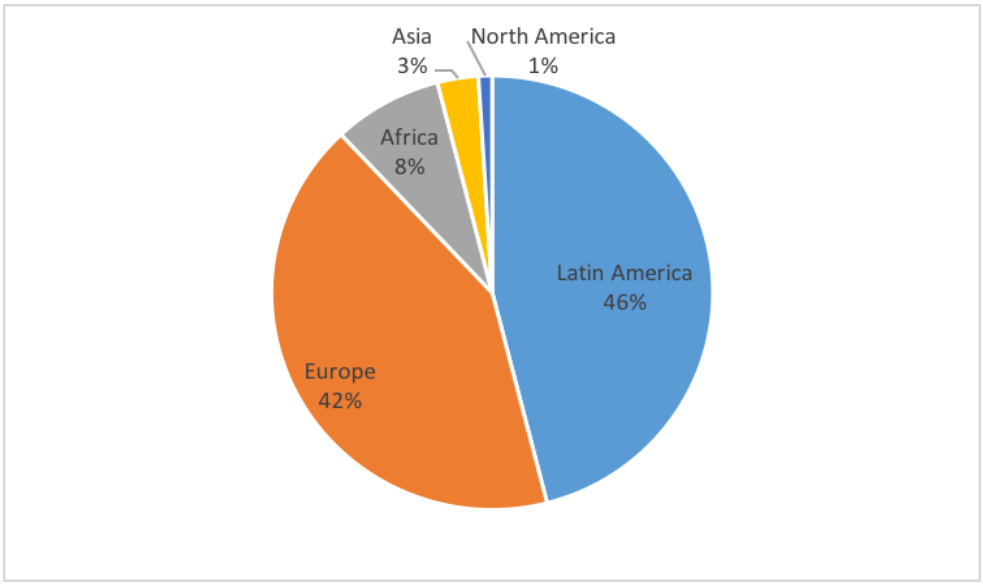

Figure 1.17 Distribution of Organic Beehives by Region 2016[24]

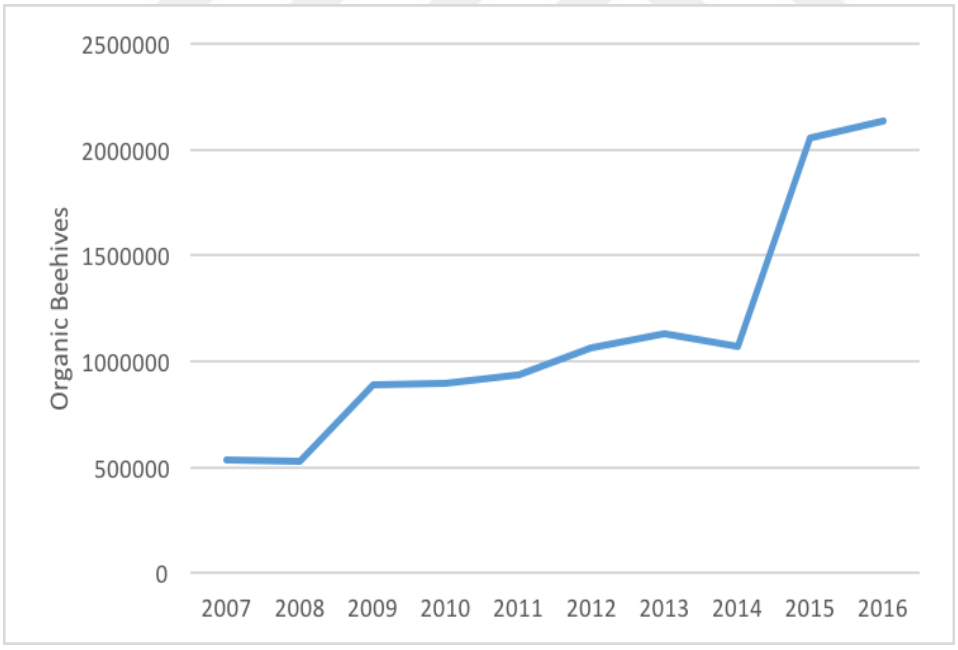

Figure 1.18 Development of Organic Beehives, 2007-2016[25]

[24] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 86.
[25] Ibid, p 87.

1.9.3.1.Outlook to Organic Aquaculture and Beekeeping in US

In US, certification of organic aquaculture production is still in process. From 2000, there are discussions on organic aquaculture. A task force, National Organics Standards Board interpreted the possibility and requests on certifying organic aquaculture, production methods. Due to opposition in terms of organic fishmeal, the final structure and legislation could not be designed yet (USDA, 2018). As shown earlier, North America's share of organic beehives is 1%, which accounts for around 200,000. The data for organic beehives in US is not available in USDA official reports.

1.9.3.2.Outlook to Organic Aquaculture and Beekeeping in EU

Europe has 22% of total organic aquaculture production in the world. Since the data of several countries is missing, this section focuses on organic aquaculture and beekeeping in EU. Ireland, Norway and Romania are the leading countries in organic aquaculture production in EU. In terms of species, mussels are mostly produced (almost 20,000 tons) which accounts for 4% in total mussel production in EU. Ireland, Denmark and Italy are major producers of organic mussels. In organic salmon production, Ireland and UK are leading countries and total organic salmon production is more than 16,000 tons with a share of 9% in total salmon production in EU. Organic aquaculture has been growing recently in EU, more specifically in organic salmon, rainbow trout and seabass production. Organic aquaculture production remains in lower scale due to limited supply and extension possibilities in production, higher risks and losses in comparison with conventional production (EUMOFA Report, 2017).

In organic apiculture, Europe has 42% of organic beehives in the world. In Europe and EU, Bulgaria has the highest number of organic beehives (236,462 beehives), followed by Italy (195,341 beehives) and France (102,767 beehives) (FIBL and IFOAM, 2018).

1.9.4. Organic Food Retail Sales

Globally, organic food market has a sale volume of approximately 90 Billion USD which was 17.9 Billion USD in 1999. US has the highest share in the global sales of organic products with 43.1 Billion USD and Germany is ranked 2nd with total sales of 10.5 Billion USD. The shares of retail sales by country and region are shown in Figures 1.20 and 1.21. It important to note that Asia which accounts for the majority of organic producers has only 9% of global retail sales. Similarly, Oceania has only 0.1% of total retail sales despite that the continent has the largest organic agricultural land whereas North America is the leading region in retail sales volume. Figure 1.22 demonstrates top ten countries with highest retail sales in organic food market. China is the only country which is outside Europe and North America and in the top 10 countries with highest sales volume in the world. Per capita consumption of organic products is 121 USD worldwide; Switzerland is the leading country in this category with a per capita consumption of 304 USD, followed by Denmark (252 USD) and Sweden (218 USD) (FIBL and IFOAM, 2018).

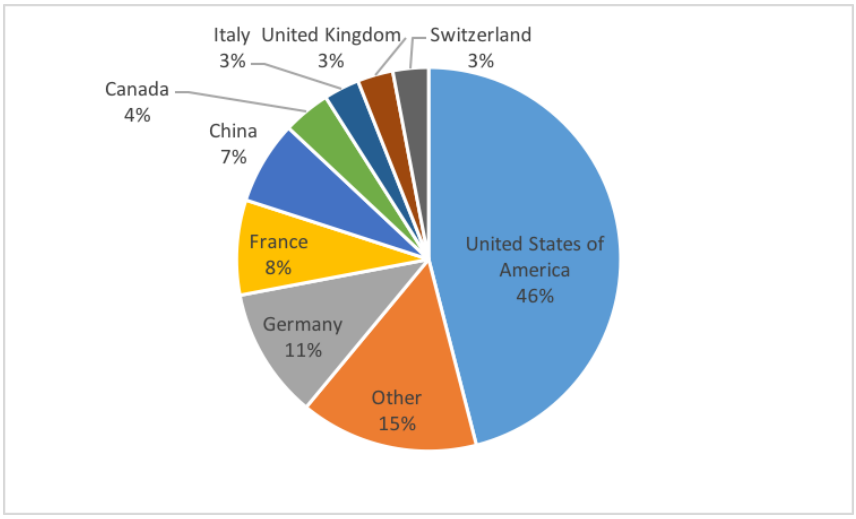

Figure 1.19 Distribution of Organic Products' Retail Sales Value by Country, 2016[26]

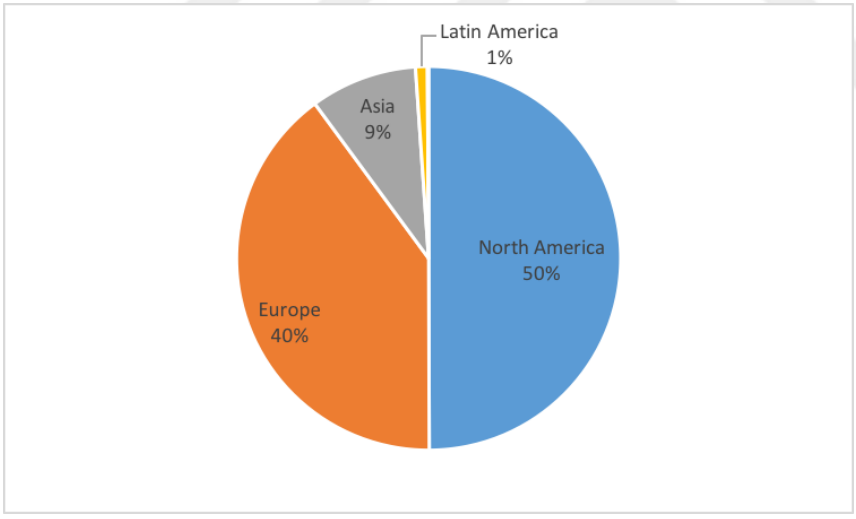

Figure 1.20 Distribution of Organic Products' Retail Sales Value by Region, 2016[27]

[26] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 70.
[27] Ibid.

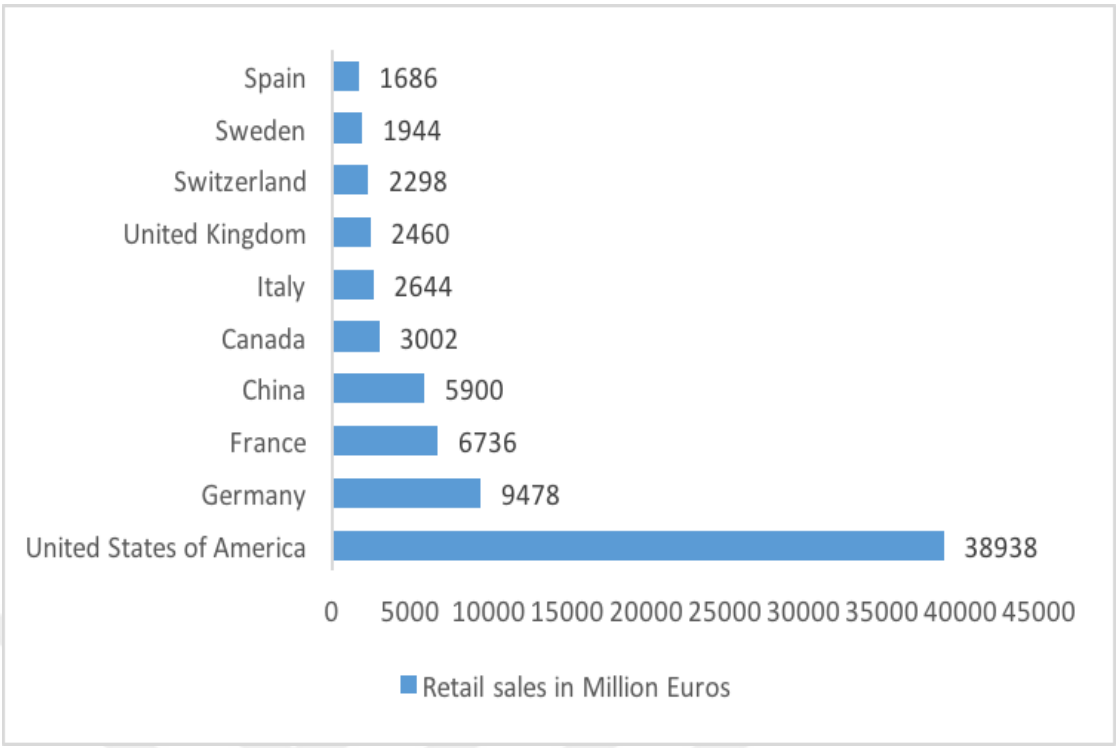

Figure 1.21 Top 10 Countries with the Highest Retail Sales of Organic Products, 2016[28]

1.9.4.1.Organic Food Retail Sales in US

The value of the retail sales is 46.3 Billion USD in 2016 in North America region where US accounts for the majority of the sales with 43 Billion USD and it is the largest market for organic products globally. The market share of organic products accounts for 5.3% of total market. As FIBL and IFOAM Report (2018) expresses, 15% of the market share is for organic fresh fruit and vegetables which corresponds to the highest market share among organic product types followed by organic milk and dairy products. Per capita consumption of organic food products is around 135 USD (FIBL and IFOAM, 2018). Organic products are mostly sold through conventional grocery channels and under private labels. It is important to note that there are crucial investments in organic food market in US. Most recently, Whole Foods Market has merged with Amazon which is the leading online retailer for 13.7 Billion USD.

[28] Ibid.

1.9.4.2.Organic Food Retail Sales in Europe and EU

EU is the second largest single market for organic retail sales following US. Organic retail sales value is 33.5 Billion Euros in Europe and 30.7 Billion Euros in EU. From 2015, there is a growth of more than 11% in retail sales in Europe. It is important to note that from 2007, retail sales in Europe has doubled. Germany has the highest retail sales volume with 9.5 Billion Euros, France is the 2nd country with the highest sales volume (6.7 Billion Euros) followed by Italy, UK, Switzerland and Sweden. In addition, countries like France and Sweden have reported double-digit growth in retail sales of organic products. Overall, western countries in Europe have larger markets; whereas central and eastern countries are important crop producers. In Denmark, the share of organic food sales in overall food sale is 10% followed by Luxembourg (8.7%), Switzerland (8.4%), Austria (7.9%), and Sweden (7.9); however, the share in central and eastern countries remains below 1%. Per capita consumption of organic food products is 41 Euros in Europe and 61 Euros in EU which are behind US. Switzerland has the highest per capita consumption with 274 Euros. European consumers mostly buy organic food products from mainstream retailers. Leading supermarkets have their own private labels, but also there are several organic shops and market chains in Germany, France and Italy which are the countries with the highest shares of retail sales.

Figure 1.23 demonstrates retail sales by distribution channels in organic food market in Europe, in 2016. The data for retail sales for many countries is limited. In most of European countries, indirect retail sales are more than 60%. On the one hand, two important leading countries in organic food market in Europe, France and Italy have significantly high shares of specialized organic retailers in the distribution channels. On the other, Germany is becoming more retailer concentrated as the share of supermarkets in retails sales of organic products has reached to 58% and the share of special retailers has decreased to 30% from 33% between 2014 and 2016 (FIBL and IFOAM, 2018).

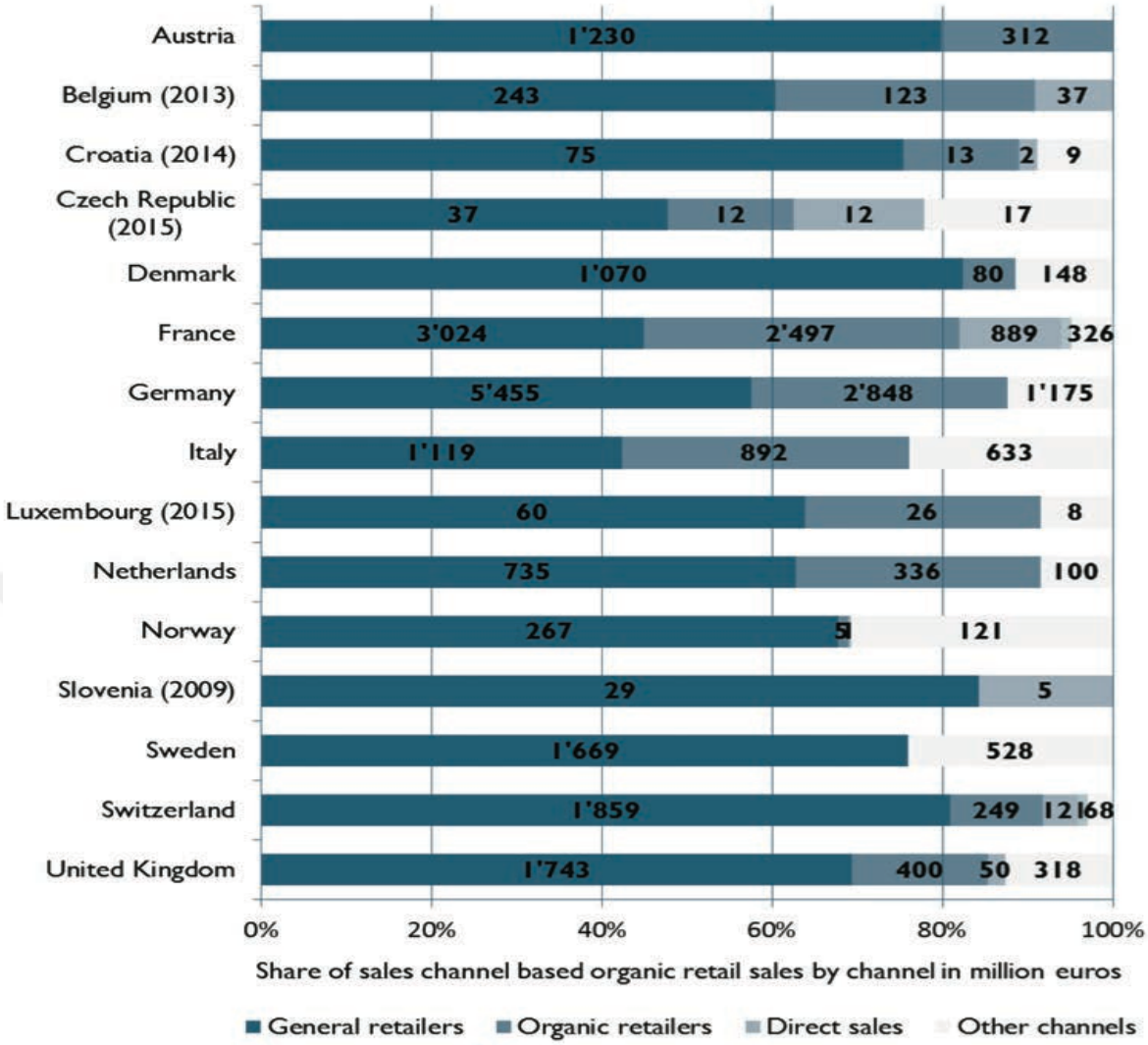

Figure 1.22 Retail Sales by Channel in Selected European Countries, 2016 (in Million Euros)[29]

[29] Source: It is constructed from the data provided by FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends" Germany: FIBL and IFOAM,2018, p 247.

1.10. ORGANIC AGRICULTURE POLICIES

Since the organic production system must be in line with the principles of organic agriculture; it is inevitable to standardize and regulate the production system and processing. Consumers expect high quality and safety from organic products; for this reason, organic standards and regulations lead guiding and controlling processes of organic production (IFOAM, 2018b). As FIBL and IFOAM Report (2018) indicates, there are 87 countries with national organic regulations; legislations of 13 are in process and at least 33 countries have adopted national organic standards mostly in Asia and Africa. Some countries do not have national legislations but they adopted national organic standards, which are constructed by the principles of IFOAM. Moreover, IFOAM Norms for Organic Production and Processing, the standards of the EU, US, Japan, China, and European private standards such as Demeter, Bio Suisse, and Soil Association are mostly applied globally in organic food (Batlogg et al., 2018). In this section we will reveal these standards and examine those of US and EU.

In the definition of the organic production processing, IFOAM Norms for Organic Production and Processing (2014) point out the importance of the integrity of organic products and the protection of environment; EU's legislation expresses the necessity of guaranteeing the organic integrity and vital qualities in processing; whereas Chinese standards focus on sustaining the nutrition and original nature of the product during the processing at the highest extent and Soil Association gives importance to authenticity and high quality of organic food (IFOAM, 2014).

In general, governments standards are less specific than private ones as they indicate less details in processing technologies, substance allowance. Batlogg et al. (2018) explain that all these standards strictly adopt the authorizations or prohibitions of specific processing methods, ingredients and substances specifically allowed during processing. Most of them also regulate the water use and application of salt, flavors,

micro-organism and enzymes (IFOAM, 2018b). They all specify allowed processing techniques that can be applied in practice; whereas they are different in terms of allowed techniques. In all standards, uses of GMOs, ionizing radiation are strictly forbidden. In terms of additives and substance, all standards take into account the use of additives and substance that are found in nature and not synthetically produced; but the number of allowed substances and additives differ by standards.

1.10.1. US Organic Agriculture Policy

In US, Organic Production Act was designated in 1990. In 2002, USDA implemented organic standards and regulation under the name National Organic Program (NOP). NOP represents assurance for consumer safety and uniform standards for organic producer and processors.

In organic production, NOP clarifies that the producer or handler of a production or handling operation who intends to sell organic product must represent an organic production or handling system plan including information on practices, substances, required documents, monitoring and recordkeeping systems, management and obstacles that are met in the organic production. That plan must be authorized by the certifying agent. NOP also demands for required precautions for soil fertility; and it only permits the use of substance that are in the NOP's list.

In terms of seeds, organic producers must use organically grown seeds, annual seedlings and planting stock. In case of unavailability of organically grown inputs commercially, the legislation allows the use of conventional alternatives. Non-organically produced planting stock can be applied in the production of organic perennial crops if it has been maintained under organic management system for more than 1 year.

Organic livestock must be from livestock raised under organic management, from the last third of gestation or hatching. NOP prohibits the certification of any livestock, breeder that are moved from organic production to conventional one as

organic. Producers must keep the required records on the organic livestock production. In terms of livestock feed, producers should apply organically grown feedstuffs, pasture, forage and these must be certified in accordance with NOP; and the uses of drugs, hormones to obtain higher growth, higher doses of feed supplements or additives, plastic pellets for roughage, formulas containing urea and manure, antibiotics are strictly forbidden. In organic livestock production, producers should have precautions for livestock healthcare, they must select species in accordance with species' suitability for site-specific conditions and resistance to diseases; they should provide a sufficient feed ration (for nutritional requirements such as vitamins, minerals, protein etc.), housing, pasture and sanitation practices to prevent diseases, free range area and less stressful conditions. In case of unsuccessful results or inadequacy of veterinary biologicals, the use of some synthetized medicines that are legally identified is allowed. Animal shelters' conditions and management are also clarified in NOP. Regarding the animal welfare, shelters must provide hygiene, exercising areas, fresh air, clean drinking water, direct sunlight; and they must be designed under the legislative requirements and should not cause any damage on soil.

NOP indicates requirements in labelling and certification process. All producers and handling operators that sell organic products must be certified by an authorized body. The official logo for certified organic products are identified by USDA. To label products as organic, the production process must meet all the requirements explained above. In labelling, there are 3 categories in organic products such as "100 percent organic", "organic" and "made with organic". A raw or processed agricultural product that is labeled as "100 percent organic" must contain 100% organically grown ingredients; whereas the organic ingredient ratio for a product that is labeled as "organic" must have at least 95% of organic ingredients except salt and water and the remaining ingredients can be non-organic if they are not commercially available as organic. For products labelled as "made with organic (specified ingredients or food groups)", this share must be at least 70% except water and salt. The list of allowed substances and additives are also listed in the legislation.

NOP indicates that certification fees should be reasonable. According to NOP, there are some cases in which producers do not need organic certifications such as

having gross income from organic product sales that is equal to 5000 USD and less annually, being a part of retail food establishment and not a processor, handling agricultural products that have less than 70% organic ingredients (USDA, 2018).

In organic agricultural policy in US, trade agreements play an important role in export and import of the organic food market. As the demand for organic food products exceed the supply, trade agreements between US and countries like Switzerland, Canada, Japan, South Korea, Taiwan and EU facilitate imports into US and fulfill the excess demand in organic food market in US (Batlogg et al., 2018).

There are several government incentives for organic agriculture in US. Firstly, The Farm Service Agency (FSA) provides consultancy with regard to costs of conversion, certification, real estate, buildings, repairs, insurance, field buffers, routine operating expenses, storage and handling equipment, crop losses, soil and water conservation, mapping field boundaries, and acreage reporting. Since 2017, USDA provides certification reimbursement up to 75% of certification costs each year, up to 750 USD certification scope. Several programs propose financial assistance to organic producers in terms of establishing protective natural borders for organic crops, crop losses due to natural disasters. Financially, marketing assistance loans to aid producers who need cash flow after harvest, deficiency payments, loans for storage facilities, and low- interest loans are available (FSA, 2018).

1.10.2. EU Organic Agriculture Policy

EU is the second single market with the highest sales volume of organic food products. In 1991, the European Council of Agricultural Ministers adopted Organic Farming Regulation as a part of European farm policy reform. In 2007, new legislation on organic farming has been introduced and it has been updated since 2009. In 2014, a proposal was adopted by European Commission and a new regulation will come into force in 2021 as European Parliament has announced (McEldowney, 2018). European legislation on organic farming ensures that the organic production should be based on ecological systems with the internal use of natural resources, prohibition of GMOs,

the use of organic input and restriction of external inputs such as synthesized chemicals.

Specifically in organic production, the legislation focuses on the enhancement of soil life, fertility, stability, biodiversity, the minimum use of non-renewable resources, recycling wastes, the use of inputs with by-products of animal and plant origin, the local and regional ecological balance, animal and plant healthcare, selection of appropriate species in animals and plants to prevent diseases, respecting animal and plant needs, having organic livestock in organic establishments from the birth or hatching and throughout their life, the use of organic feedstuffs, the provision of animal welfare. In organic processing, the legislation proposes the use of organic ingredients, restriction of additive use, prohibition of substance use that can damage the nature of product. In terms of organic feed, European legislation indicates that organic feed must be produced by organic materials and contain feed additives and processing aids in the minimum amount allowed. The adaptation of biological, mechanical and physical methods is essential and any use of GMOs, ionic radiation is strictly forbidden in production and processing.

In organic plant production, multiannual crop rotation is required to maintain and increase the level of fertility and biological activity. The fertilizers and soil conditioners can only be used if they are listed in the legislation and the use of mineral nitrogen fertilizers is not approved. In organic livestock production, organic livestock should be raised in organic production establishments and can be brought to the organic facility at the beginning of the conversion period. The staff in animal shelters must be informed and educated in relation with organic livestock needs, welfare, healthcare, husbandry practices. Animal welfare is essential and animals must have open air space preferably pastures for exercising, the number of animal must be limited in order to reduce overgrazing, poaching of soil, erosion, pollution in organic facilities. In addition, organic livestock must be located separately from other livestock. In animal breeding, use of natural methods is required, but also artificial insemination is allowed in case the reproduction does not include hormones or artificial substances and animals suffer from the reproduction process. In animal feedstuffs, use of organic feed is essential. In animal healthcare, organic treatment is required, in specific cases

the use of antibiotics is allowed under strict rules. Hygiene in shelters is also strictly regulated.

The legislation also guides producers for the conversion period. The conversion period should start immediately after the producer's notification to certifying agent and products of conversion period must be kept and labeled separately from organic ones. The period is assessed by the certification body.

In labelling, organically labeled products should contain organic ingredients at least 95% by weight. The information on product's ingredients must be clearly identified with agricultural origins and formatted as the legislation orders. The label should include information on certification body, EU organic logo –Euro leaf-, information on country of origin and production place of agricultural raw materials (European Commission, 2010). The label may include "EU Agriculture" name if the agricultural raw material has been farmed in EU, and "non-EU agriculture" if they have been farmed in third countries. The legislation also allows labeling as "EU/non-EU Agriculture" where the agricultural raw materials has been farmed both in EU in third countries. The legislation also allows the use of prefixes such as bio and eco.

In control and certification, member states should construct a control system and designate one or more competent authorities as responsible which authorizes control bodies. Council Regulation (EC) No 847/ 2007 states that all organic producers except wholesalers of pre-packaged products and operators selling to the final product to the consumers will be controlled at least once a year by control bodies (Official Journal of The European Union, 2007). There have been new updates in terms of standards of the production of aquaculture in 2010 and wine in 2012, trade agreements with Canada and US in 2011 and 2012.

In terms of certification, the implementation of TRACES system is crucial. In EU organic food market. TRACES stands for trade control and expert system. The system is EU multilingual management tool for all sanitary requirements of food products importing into EU and it enhances online traceability and certification

process, helps to prevent fraudulent actions, improves and facilitates administrative procedure, information exchange for all parties involved in trade. There are about 80000 users from more than 30 countries and it is accessible 24/7. EU has implemented TRACES system for organic imports in 2017, and e-certification has been taken place since then (European Commission, 2016a, 2016b).

The trade agreements in EU is also an important part of the organic food market. The legislation permits import and export in member states. In organic import and export with non-member countries, EU has recognized several third countries which have equivalent rules in organic production and control systems to better sustain a wide range of organic products to consumers. These countries are Argentina, Australia, Canada, Chile, Costa Rica, Israel, India, Japan, New Zealand, South Korea, Switzerland, Tunisia, US (European Commission, 2016c).

The important highlights in the European legislation on organic farming in 2007 are explained above. As mentioned earlier, there is a new proposal for a new organic farming legislation which will take into force in 2021. It is important to note that there are several updates and adjustments in the new organic legislation. Current legislation has complexities in accordance with guiding producers and other third parties involved; the new legislation aims to have a simpler and uniform set of rules in organic agriculture (McEldowney, 2018). One of the main adjustments in the new legislation is implementing the regimes of equivalence and compliance. Compliance regime proposes that all organic agricultural products in EU market must be produced under the set of rules defined by EU regulation and all operators must be controlled by authorized control bodies that are accredited in accordance with EU regulation. In equivalence regime, all organic agricultural products in EU market must be produced under the set of rules equivalent to those of EU regulation and all operators must be controlled by authorized control bodies that are accredited equivalently in accordance with EU regulation. McEldowney (2018) also includes that in the new organic farming legislation, the rules are more strengthen and harmonized; it prohibits mixed production in organic and non-organic establishments, the control requirements are based on a single legislative framework, a risk-based approach including official

controls takes place instead of annually mandatory controls, group certification is allowed to reduce production costs such as certification costs (McEldowney, 2018).

In EU, there are several incentives for organic agriculture under Common Agriculture Policy (CAP). From 2014, CAP decided to invest over 100 Billion Euros in rural areas in order to develop farming and solve challenges of soil, water quality, biodiversity and climate change from 2014 to 2020. The new CAP provides 30% of direct payments to farmers practicing eco-friendly activities and 30% of the budget given to the rural development programs as support for organic farming (European Commission, 2016d).

1.11. THE IMPACT OF INSTITUTIONS AND NGOS IN ORGANIC FOOD MARKET

Organic food market is a growing sector since 1970s. In 1980s several NGOs, institutes, research centers and associations have aroused to expand organic agricultural principles and practices worldwide. FAO (2018d) explains that there are 54 institutions aiming to work on organic agriculture. These institutions function as research centers, associations, NGOs, non-profit organizations, state programs, websites, societies, independent and university institutes. Some of them are national base associations that aim to contribute to the development of organic agriculture and food market in their countries or specific regions; whilst others are international ones concentrating on standardizations, policies, reports, researches, conferences on organic food market and agriculture. There are several internet portals in which trainings, information, guidelines, technical support, discussion fora for organic agriculture are provided. Moreover, there are several websites with database of scientific articles and papers on organic agriculture and related fields.

IFOAM, FIBL are most important contributors to organic agriculture as international institutions. In addition, International Society of Organic Agriculture Research (ISOFAR), Demeter, Rodale Institute, International Centre for Research in Organic Food Systems (ICROFS), International Competence Centre for Organic Agriculture (ICCOA), Organic Research Centre Alliance (ORCA) are important international organizations in organic agriculture and food market. Furthermore, UN and FAO have contributed to the expansion of organic agriculture, several sub-organizations have been founded under their sponsorships. In 1999, FAO has started to apply a cross-sectoral program in organic agriculture including several distinct function aiming to inform member countries on organic management and it has partnerships and collaborations with several national organic programs, associations, NGOs and research centers (FAO, 2001).

Brécard (2017) expresses that NGOs also concentrate on harmonization in labeling criteria and construct a uniform standard. In this term, as mentioned before, Demeter is an important contributor as it has own organic standards that are more stringent than national ones. Countries with no national standards mostly apply the standards implemented by international organizations. Since the data for several developing countries is missing or does not exist, international NGOs and institutions contribute to examine and prospect the statistics on organic agriculture and food market. IFOAM and FIBL publish yearly evaluation reports on organic agricultural statistics and trends worldwide.

It is also noteworthy to mention about institutes having similar objectives with regard to organic agriculture and food market. Fair Trade Labelling Organization (FLO) have several common principles with organic agriculture in the production process. Pesticide Action Network (PAN) focuses on pesticide use and functions as a platform that brings together NGOs, institutes, individuals worldwide. Forest Stewardship Council (FSC) is another NGO that supports environmentally appropriate use of forests.

From a global perspective, it is important to note that NGOs have several impacts on the development of organic agriculture worldwide. Despite providing information, education, training, statistics on organic agriculture and food market, Brécard and Chiroleu-Assouline (2018) state that NGOs have a growing pressure on firms in order to protest harmful substance or additives on products such as palm oil; and for instance, Greenpeace's protest against harmful substances in the products of Nestle became substantial. They state that NGOs pressure may result in several ways; firms can stop to produce the product consisting of harmful substances or they can involve in R&D activities to substitute them with a healthier counterpart. Brécard (2017) also found that NGOs labeling in environmental friendly product has more stringent standards and benefits in welfare. Similarly, Santacoloma (2005) points out the contribution of NGOs in food security.

1.11.1. Impact of Institutions and NGOs in US Organic Food Market

There are several NGOs and state based institutions that aim to ameliorate information and awareness in organic agriculture and food market in US. Research centers that are organic agriculture oriented like Alternative Farming Systems Information Center (AFSIC), state based research service providing outlooks, statistics and important assessment of policies like Economic Research Service (ERS) aim to enhance and ameliorate public knowledge and contribute to the development of the sector. USDA has also sponsored Sustainable Agriculture Research and Education Program which contributes to fund projects, education and benefits database and online resources including organic agriculture; Organic Trade Association that aims to protect and promote organic products. University based institutes are also wide spread in US. University California has several research centers which have online platforms, educational activities on organic agriculture including state programs. Michael Fields Agriculture Institute is a non-profit institute and it provides public programs in this field.

Organic Farming Research Foundation is an NGO focusing on scientific researches and results, projects, education, grant application and information on US organic agriculture policy for organic farmers across US. Moreover, as an online NGO, Organic Consumer Association (OCA) also aims to help and enlighten consumers in organic agriculture (FAO, 2018d).

1.11.2. Impact of Institutions and NGOs in EU Organic Food Market

FIBL is the leading authority on European organic agricultural research. The database of research, publications, links, conferences training across EU create a substantial source in organic agriculture and food market. European Land Owner Organization (ELO) is an NGO which brings together land owners in EU but also it has several works and informative releases on organic agriculture, e.g. use of organic fertilizer, management of organic agricultural lands, biodynamic farming. As a part of ICROFS, Coordination of European Transnational Research in Organic Food and Farming Systems (CORE Organic) is a network that can be classified as ERA-NET

which represents a network of European ministries and research councils funding research in organic food systems at national levels and is supported by EU funding (CORE Organic, 2018). ERA-NET mainly aims to constitute a joined fund for transnational projects and partnerships in order to ameliorate the quality, relevance, utilization of resources for organic farming and to collaborate regarding the challenges in organic value chains. In addition to EU based institute and NGOs, branches of international organizations and NGOs like IFOAM EU, PAN EU have important roles in the development of the market.

Despite of joint networks and institutes in EU, there are national based organizations and institutions in member countries. In UK, Soil Association provides organic certification as an NGO. The association also functions as a platform allowing memberships for farmers, giving information and education about organic farming and promoting a virtual library that presents its own publications. In Spain, Spanish Society for Organic Farming and Agroecology (SEAE) brings together farmers, scientists to adopt environmentally sustainable agricultural systems. In Germany, German Institute for Tropical and Subtropical Agriculture, and Transdisciplinary and Social-ecological Land Use Research (DITSL) is an NGO that aims for wide spreading socially ecological land use and sustainable development in terms of food and income security in Africa, Latin America and Asia (DITSL, 2018). As a non-profit organization, Louis Bolk Institute offers a platform for scientific research and aims to bringing new insights in organic agriculture in Netherlands. Danish Institute of Agricultural Sciences is a government initiative that represents statistics, surveys and information. Danish Research Center for Organic Farming makes contribution in terms of projects, meetings, publications and discussion forum. Similar to US, there are several independent and university institutes that have research and projects on organic agriculture (FAO, 2018d).

1.12. DEVELOPMENT OF ORGANIC FOOD MARKET IN TURKEY

As a developing country, Turkey has a potential for organic production in both domestic market and international trade. In Turkey, organic agriculture may be expanded in order to benefit from better health and environment conditions and from the opportunity to export the products, which cannot be found or grown in developed countries. Since the study focuses on organic agriculture and food market in Turkey, this section will reveal an outlook and statistics on organic agriculture, livestock and aquaculture production, retail sales and government organic agriculture policy in Turkey.

1.12.1. Outlook to Organic Agriculture in Turkey

Turkey has 523,777 Hectares of organic agricultural land, 137,433 Hectares of this area is used as wild collection in 2016 and it has increased to 544,033 Hectares in 2017. It is ranked as 17th country with the largest organic agricultural land in 2016. The share of its organic agricultural land is 1.4 %. Between 2015 and 2016, the growth in organic land is 37,708 Hectares which accounts for 7.8%. During 2007 and 2016, the 10-year growth is 399,514 Hectares and it accounts for 175.2%. The country is by far the leader among CPC (Candidate and Potential Candidate) countries in EU in terms of organic agricultural lands (FIBL and IFOAM, 2018; Ministry of Agriculture and Forestry, Turkey, 2018a). Figure 1.24 demonstrates the growth of organic agricultural lands in Turkey between 2002 and 2016. It is seen that there is a sharp decline in 2015. GEKA (2017) expresses the reason of this decline as the exclusion of 2B and forest lands from the organic agricultural areas. Regarding the organic land use, there are 294146 Hectares of arable lands, whilst permanent lands crops are 211,227 Hectares and permanent grasslands are 15,499 Hectares as of 2016.

Figure 1.25 shows that organic food production has an increasing trend, although there is a little decline in 2013. In 2017, the total organic production of Turkey is 2.4 Million Tones. From 2015 to 2016, the organic production has risen by 35.2% (approximately from 1.8 Million to 2.5 Million Tones). There is a very little decrease during 2016 and 2017. The share of organic agricultural lands is 1.4% as of 2016, and Turkey is ranked 2nd among CPC countries of EU after Montenegro (FIBL and IFOAM, 2018).

As of 2017, there are more than 75,000 organic producers in Turkey. Turkey is the 8th with the highest number of organic producers in the world and the 1st in Europe in 2016. There are 1,422 organic processors, 61 organic importers and 46 organic exporters in Turkey. In Figure 1.26, the growth in the number of organic producer in Turkey is shown. Regarding the implementation of Organic Law in 2004 and Organic Farming Information System in 2005, there is a tremendous increase in the number of organic producers from 2008. In terms of products, Turkey is among the major producers of organic cereal, temperate fruit, grape and top permanent crops in 2016. It is important to express that the number of organic food products has risen from 150 to 225 during 2002 and 2016 in Turkey as Figure 1.27 shows.

Turkey has started its organic practices within export activities in 1984. As of 2016, Turkish organic export value has reached to 78 Million USD. Figure 1.28 demonstrates that from 2011, there is an increasing trend in organic export except 2015. As seen in Table 1.4, Turkey's top three export partners in organic food are US, Germany and France. These three countries correspond to 1/3rd of the total export value. The EU is the largest export market for Turkish organic goods, but also US, Canada, Australia, Iraq, Switzerland and Japan import organic products from Turkey. It is important to note that most of these countries have accomplished significant growth in the global organic market in recent years and Turkey's export has been directed to largest organic markets in the world. In Table 1.5, Turkey's mostly exported organic products are listed. As shown, hazelnut, fig, raisins and their products have the highest share in organic products export value and quantity (FIBL and IFOAM, 2018).

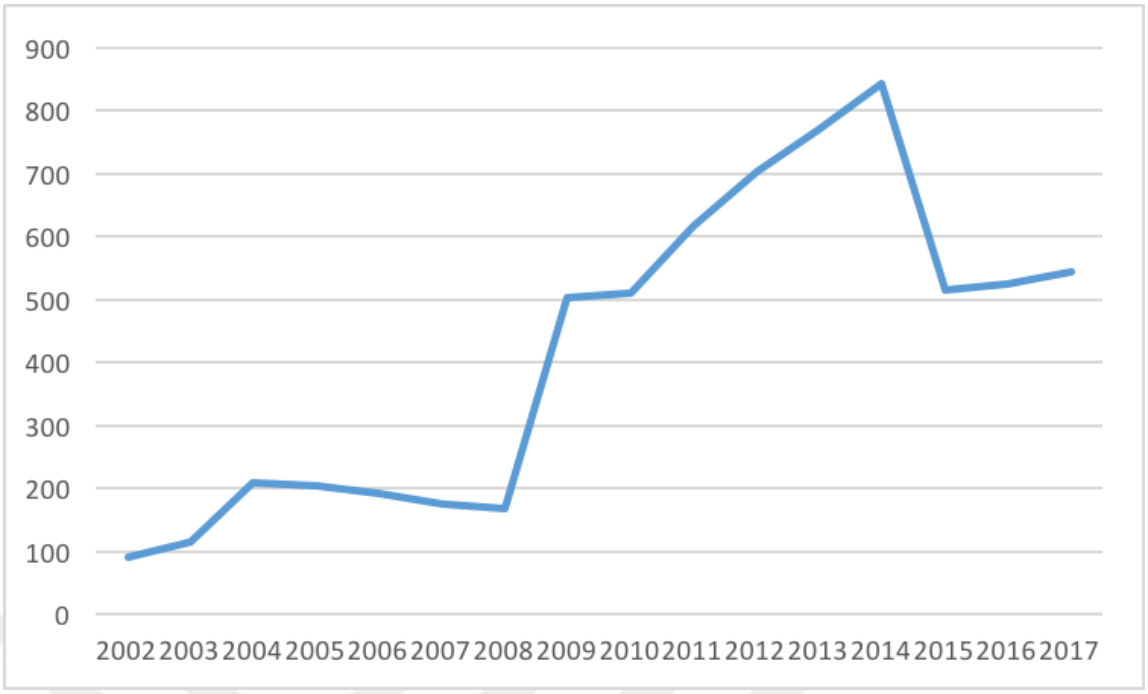

Figure 1.23 Total Organic Production Land in Turkey, 2002-2017 (in Thousand Hectares)[30]

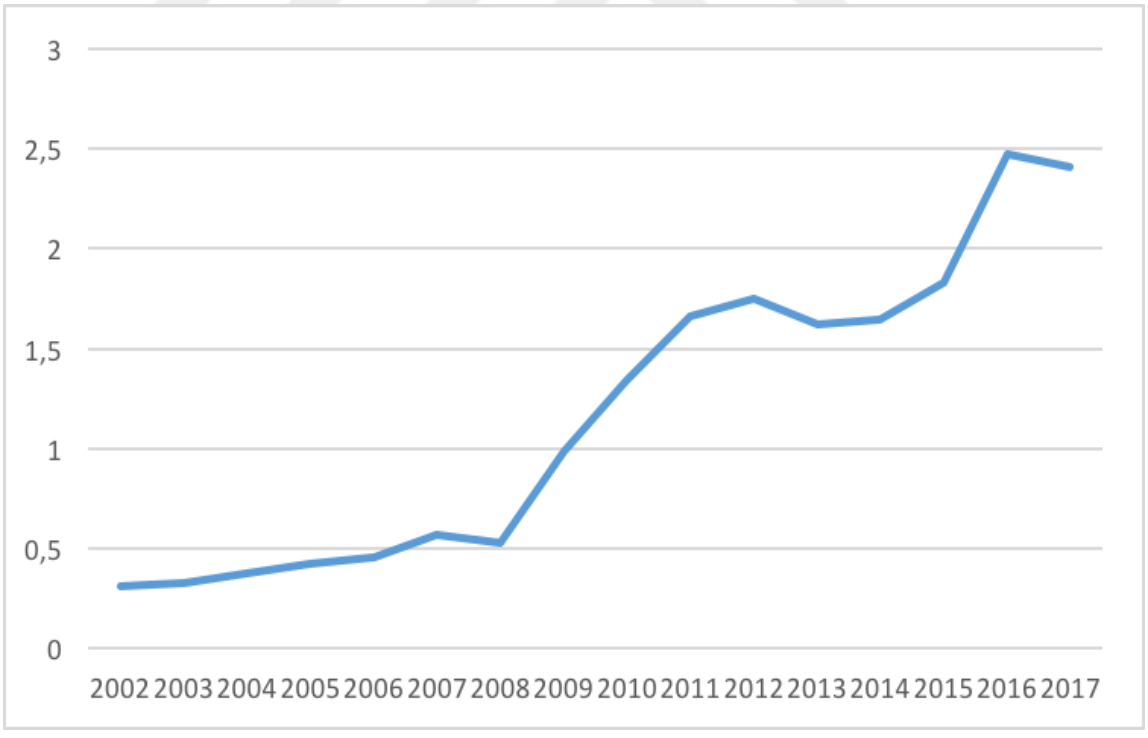

Figure 1.24 Total Organic Production in Turkey 2002-2017 (in Million Tones)[31]

[30]Source: It is constructed from the data provided by The Ministry of Agriculture and Forestry, Turkey Official Website: https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler, 2018.
[31] Ibid.

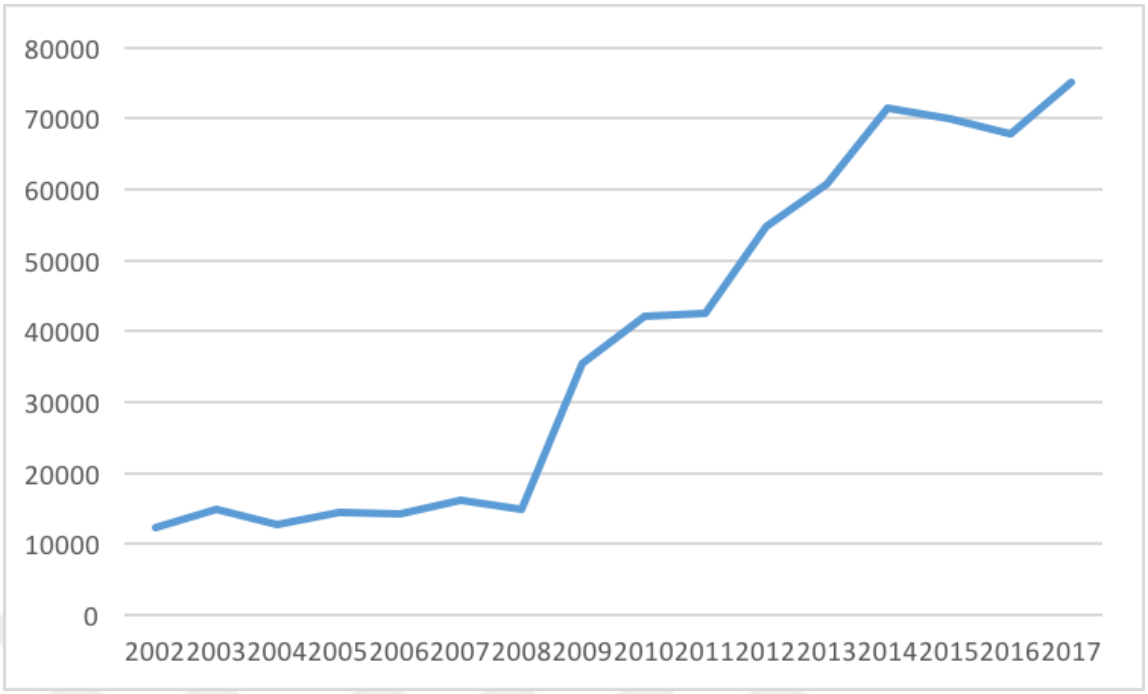

Figure 1.25 Total Number of Organic Producers in Turkey, 2002-2017[32]

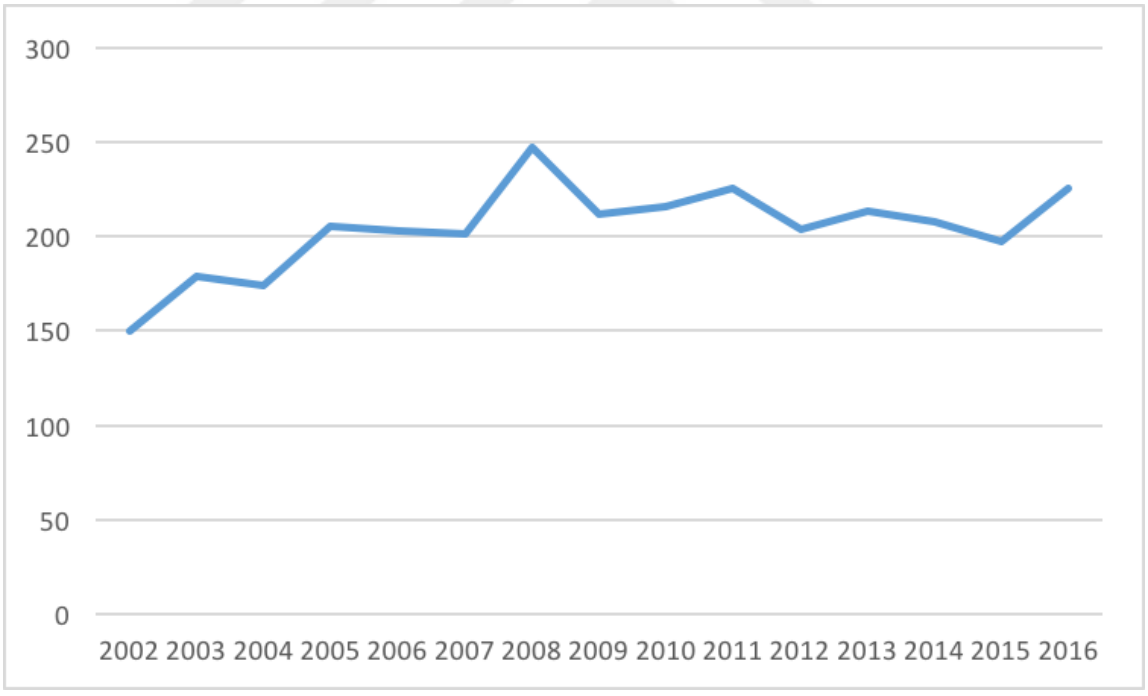

Figure 1.26 Total Number of Organic Product Type in Turkey, 2002-2016[33]

[32] Ibid.
[33] Ibid.

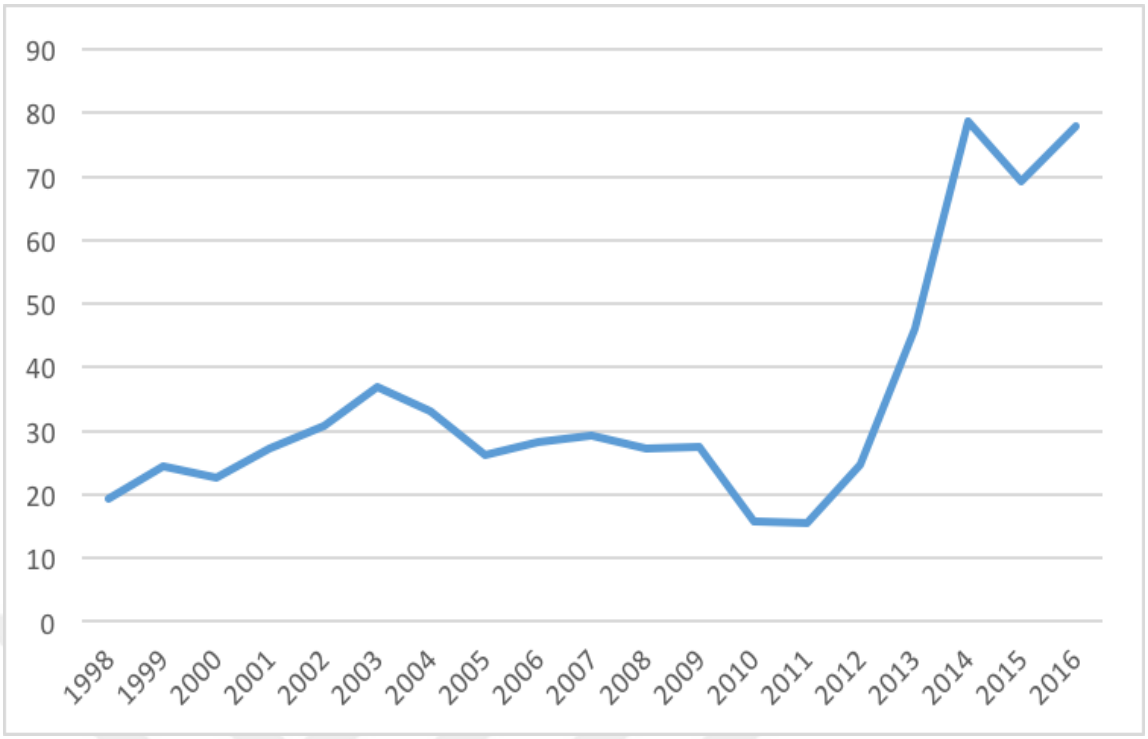

Figure 1.27 Turkey's Organic Product Exports, 1998-2016 (in Million USD)[34]

There are several imported organic food products in Turkey. It is important to emphasize that many of imported organic food products are suitable to be produced in Turkey as seen in Table 1.6. As discussed above, Turkey has a great potential to produce organically, thus many Anatolian rural areas are naturally suitable for organic production and the local farmer profile -such as family farms- is an advantage for organic agriculture (Rehber, 2011). However, the domestic market remains small, the demand for organic products do not increase as expected. Referring to Table 1.6, the most imported organic products into Turkey are extra virgin olive oil, corn, soybean -for consumption-, wheat, sunflower and its products in 2017. Turkey's organic imports are mostly from Russia, Kirghizstan, Germany and Netherlands.

[34] Ibid.

Table 1.4 Countries that Turkey Export Organic Products[35]

Country	Quantity (in Thousand Tones)	Value (in USD)	Quantity share (%)	Value in USD share (%)
United States of America	2897	14,357,313.26	17.2	18.4
Germany	2414	13,402,071.14	14.4	17.2
France	1979	11,463,475.50	11.8	14.7
Netherlands	1495	10,593,721.25	8.9	13.6
Switzerland	1281	6,353,764.37	7.6	8.2
Italy	568	4,807,593.23	3.4	6.2
United Kingdom	799	4,144,944.06	4.7	5.3
Sweden	564	3,139,275.90	3.4	4.0
Canada	698	2,599,795.22	4.1	3.3
Japan	213	1,248,665.52	1.3	1.6
Turkish Republic of Northern Cyprus	2318	887,299.79	13.8	1.1
Australia	175	776,312.81	1.0	1.0
Denmark	112	582,517.08	0.7	0.7
Total	**15,513**	**74,356,749.13**	**92.2**	**95.5**
Overall (Cumulative)	**16,819**	**77,831,368.00**	**100**	**100**

[35]Ibid.

Table 1.5 Turkey's Exported Organic Products, 2016[36]

Product Type	Quantity (in Thousand Tones)	Amount (in USD)	Quantity (%)	Amount in USD (%)
Hazelnut and its products	2466	24,975,616.46	14.7	32.1
Fig and its products	3676	18,665,594.94	21.9	24.0
Raisins	3393	12,456,025.53	20.2	16.0
Apricot and its products	1845	10,996,054.17	11.0	14.1
Fruit and fruit products	1758	6,222,986.33	10.5	8.0
Spice	91	765,829.65	0.5	1.0
Soy bean	1600	680,000.00	9.5	0.9
Vegetable and vegetable products	246	587,259.96	1.5	0.8
Pistachio	22	492,932.44	0.1	0.6
Cotton and cotton products	46	357,066.67	0.3	0.5
Lentil and its products	134	310,644.12	0.8	0.4
Sesame	52	229,930.00	0.3	0.3
Wheat and its products	610	186,877.47	3.6	0.2
Chickpea	61	144,176.38	0.4	0.2
Total	**16001**	**77,070,994.12**	**95.1**	**99.0**
Overall (Cumulative)	**16819**	**77,831,368.00**	**100**	**100**

[36] Ibid.

Table 1.6 Turkey's Imported Organic Products, 2017[37]

Product Type	Quantity (Tons & Liters)	Production Country	Product Type	Quantity (Tons & Liters)	Production Country
Extra Virgin Olive Oil	1000	Italy	**Tomato (Dried and Ketchup)**	29.86	Germany, Netherlands
Soy Bean for consumption	95241	Russia, Ethiopia, Kazakhstan	**Rice Floor and Starch**	28.77	Italy, Belgium
Corn	64168	Russia	**Noodle**	25.04	Italy
Wheat	63701	Russia, Kazakhstan, UAE	**Fruit Puree (Banana)**	20	Ecuador
Sunflower and its products	5554	Russia, Netherlands, Austria, Germany, US	**Date Paste and Molasses**	20	Iran
Lentil	4805	Russia	**Medical Perfumed Plants (Thyme)**	19	Morocco
Canola Oil	1722	Russia	**Black Cumin (Seed and Oil)**	18.12	India
Dried Fruit (Plum, Apple, Date, Fig, Goji Berry)	334.88	Kirghizstan, France, Iran, Pakistan, United Kingdom, Tunisia, China, Iraq	**Buckwheat Pop and Roasted Cereal (Muesli)**	5.72	Germany, Lithuania
Caper (Canned)	70.86	Kirghizstan	**Barley**	0.75	Russia
Fruit Juice (Apple and Sour Cherry)	70.7	Germany	**Fruit Tea and Powder**	0.66	Germany, South Africa
Raisins	61	US, Slovenia	**Chocolate Powder**	0.35	Germany
Sesame (Seed)	55.05	Uganda , Ethiopia, India	**Rough Rice**	0.26	Russia
Ginger (Granulated)	50	India	**Herbal Tea**	0.14	Germany
Turmeric	50	India	**Pistachio**	0.04	Kirghizstan
Bean (Dried), Shell Beans	47.5	Kirghizstan, China			

[37] Ibid.

1.12.2. Outlook to Organic Livestock Production in Turkey

Turkey has an advantage for organic livestock production as the use of chemically synthetized inputs are at a lesser extent in agriculture; thus conversion to organic pastures are more suitable. However, due to the low demand in the domestic market and problems caused by animal diseases in the export market; organic livestock production has not increased at a higher growth rate (Özen et al., 2009). According to the Ministry of Agriculture and Forestry of Turkey (2018a), the number of organically grown bovine animals and calf for meat production is 3116 in 2017. The number has decreased by 27% between 2014 and 2017. In organically grown sheep, the head number is more volatile over years. The number of organically grown sheep is 30,867 in 2017 and it has risen by 18% from 2014. In 2016, the number of sheep has sharply decreased but in 2017 it has increased by 70%. On the other hand, there is sharp decrease in the number of organically grown milk cow from 7219 to 2526 during 2014 and 2017. Figure 1.29 shows the changes in head numbers of organic livestock between 2014 and 2017.

In organic milk production, there is a tremendous increase between 2014 and 2017, as the production has grown by more than 50%. Organic egg production has almost tripled between 2015 and 2016, but the rate of growth has slowed down between 2016 and 2017 as it has increased by less than 10% (Table 1.7).

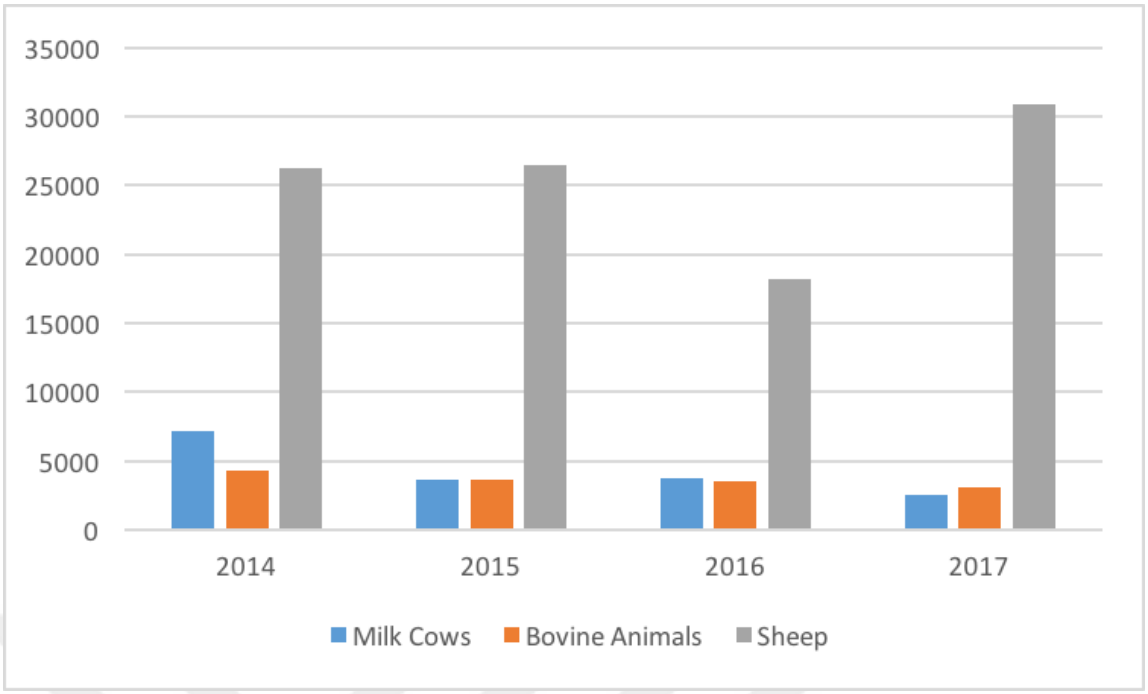

Figure 1.28 The Head Number of Organic Livestock in Turkey, 2014-2017[38]

Table 1.7 Organic Cow Milk and Egg Production in Turkey, 2014-2017[39]

Year	Cow Milk Production (Tons)	Egg Production (Number)
2014	15509.7	64,898,912
2015	19739.4	58,938,769
2016	21431	147,600,367
2017	33091	161,2504,080

[38] Ibid.
[39] Ibid.

1.12.3. Outlook to Organic Aquaculture and Beekeeping in Turkey

Turkey is a country with three sides surrounded by the sea and it is an advantage for aquaculture production. The data of organic aquaculture is very limited as it only shows statistics of the year 2015. It shows that species such as seabream and seabass are organically produced with amounts of 317.2 and 241.8 metric tons, respectively. According to FIBL 2018 survey, Turkey has 559 metric tons of organic aquaculture production in 2016 (FIBL and IFOAM, 2018).

Organic beekeeping activities have an increasing trend in Turkey. Due to ecological and health concerns, the demand for organic apicultural products has also increased (Özen et al., 2009). As Figure 1.30 demonstrates, the number of organic beehives has reached 89167; the growth rate between 2014 and 2017 is more than 50%.

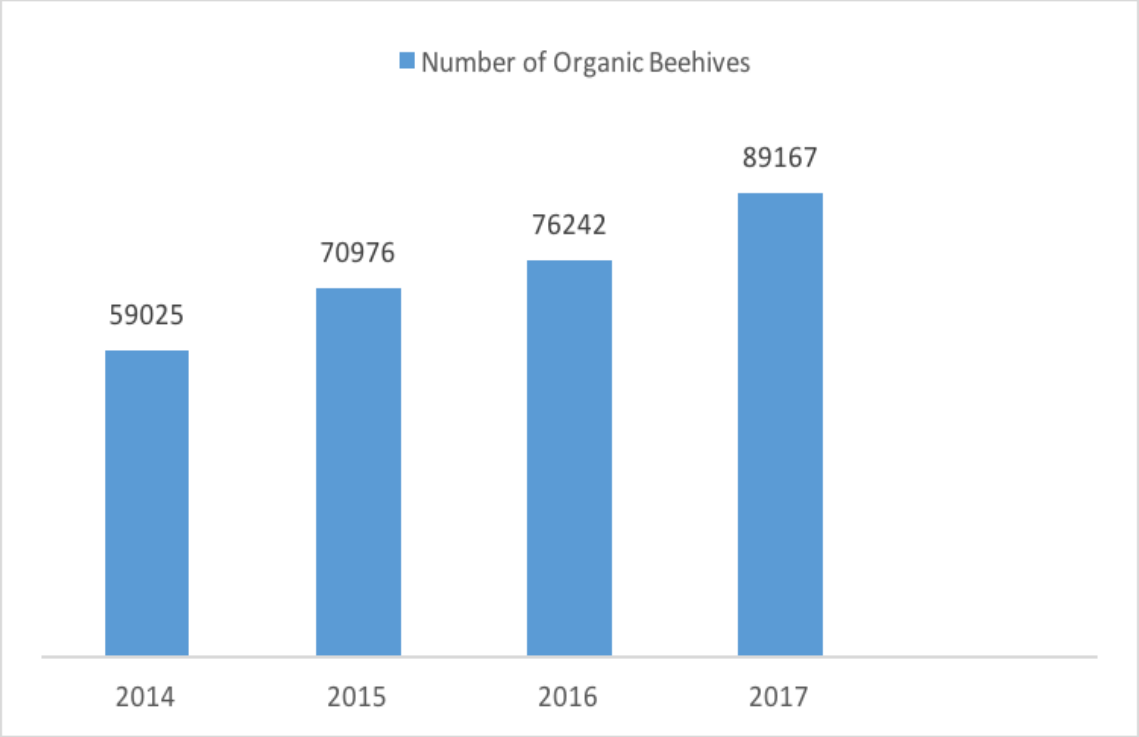

Figure 1.29 Number of Organic Beehives in Turkey, 2014-2017[40]

[40] Ibid.

1.12.4. Organic Food Retail Sales in Turkey

In comparison with the export market, domestic organic food market remains small in Turkey. Statistics show that almost 65% of the total organic production in Turkey are exported in 2016. Since the data for the export in 2017 is missing, we have only given statistics for 2016. Data for the domestic organic market is missing as TURKSTAT -the official statistic institute in Turkey- has not categorized organic product sales. USDA's (2016c) Report on Turkish Organic Food Market expresses that organic packaged food product sale volume is 90 Million USD in 2015 and it is estimated to reach 170 Million USD by 2020. The report shows that from 2013 to 2014, the growth in organic packaged food product sale is 24%. Organic dairy, baby food, and snack food products are mostly sold as Table 1.8 shows. Moreover, as important ingredients in Turkish cuisine, organic cheese and olive oils have potential to have higher sales growth in Turkey (USDA, 2016c).

As mentioned before, Turkey has started organic agricultural activities as an exporting country. From the 2000s, with regard to increasing health, environment concerns in the society, the demand for organic food products has grown similar to the global trend. However, most of the organic production are export-oriented in Turkey, but the domestic market has a promising potential. As it is seen in Table 1.9, organic packaged food products are mostly sold in supermarkets and hypermarkets. Internet retailing has a very small share in retail sales. The shares of farmers' market and organic bazaars which have been becoming an important venue to meet organic food consumers' need since 2000s are not classified. Under the support of an NGO, Bugday Association for Supporting Ecological Living that aims to promote organic production and consumption in the country, there are several organic bazaars where consumers may detect organic certification of producers, gather information about organic production and its principles, and only recycled packages are allowed[41].

[41] Source: Bugday Association for Supporting Ecological Living Official Website: http://www.bugday.org/portal/haber_detay.php?hid=8006, 2018.

Table 1.8 Domestic Sales of Organic Food Products in Turkey, 2009-2014[42]

Product Type	2009	2010	2011	2012	2013	2014
Organic Baby Food	2.3	4.9	7.9	10.1	12.5	14.8
Organic Bakery Products	-	-	0.2	0.3	0.4	0.5
Organic Dairy	2.2	2.7	10.6	15.7	16.0	21.8
Organic Oils and Fats	1.9	2.3	2.9	3.6	4.7	5.9
Organic Rice	1.0	1.2	1.4	1.6	1.8	2.4
Organic Spreads	-	-	-	1.5	1.9	2.4
Organic Sweet and Savory Snacks	7.9	8.7	9.7	11.1	12.4	13.6
Total Organic Packaged Food	**15.3**	**19.8**	**32.7**	**43.9**	**49.7**	**61.4**

Table 1.9 Sale Distribution of Organic Packaged Food Products in Turkey, 2009-2014[43]

Type of Retailer	Shares per years (%)					
	2009	**2010**	**2011**	**2012**	**2013**	**2014**
Hypermarkets	40.0	38.2	35.4	32.5	32.8	33.0
Supermarkets	46.0	47.0	49.0	51.0	51.0	51.1
Independent Small Grocers	6.5	7.0	7.5	8.0	8.2	8.3
Other Grocery Retailer	7.0	7.2	7.4	7.7	7.2	6.8
Internet Retailing (Non-Store Retailing)	0.5	0.6	0.7	0.8	0.9	0.9

[42] Source: It is constructed from the data provided by USDA, "Turkish Organic Market Overview" (TR6005), US: USDA, 2016, p 2-3.
[43] Ibid.

1.13. TURKEY'S ORGANIC AGRICULTURE POLICY

Organic production has begun with foreign companies' incentives in 1984, in Turkey. The certification process was based on European standards. In 1991, Ecological Agriculture Organization (ETO) was founded. It has an advisory function for Ministry of Agriculture and Forestry, Turkey (IFOAM, 2012). In 1994, the organic plant production is regulated for the first time. The first national symposium on organic agriculture took place in 1999. The department of Organic Agriculture was established in 2003 in the Ministry of Agriculture and Forestry. The organic law 5262 was firstly adopted in 2004 and it has been updated in 2005, 2010, 2015 and 2018. It is a reformed version of the public act accepted in 1994. Its main context is the certification and conduct of organic farming activities. The legislations have aimed to develop organic agriculture in compliance with EU regulation.

Regarding the general rules of organic agriculture, the organic farming law clarifies that the producer should take precautions in order to prevent contamination in compliance with the control and certification body reports. Establishments and materials used in conventional production may be used in organic agricultural practices if and only if they are cleaned and disinfected. It is strictly forbidden to use GMOs and any substances, additives, feedstuff containing GMOs. The separation of holdings where both conventional and organic agricultural practices take place, the minimum use of non-renewable resources and non-farm inputs, recycling and regional and ecological balance are essential (Ministry of Agriculture and Forestry, Turkey. 2004).

In order to start organic agricultural activities, the producer must apply to an accredited control and certification body by representing all required documents and records as a first step. Then the control and certification body decides whether the producer may start organic production. If the producer is approved by the body, both

sides have to arrange a contract. The producer may practice organic production alone or with a producer group. In case of affiliation with a producer group, the producer must sign a contract with other producers in the group and he/she makes a contract with the control and certification body on behalf of the producer group. The producer also makes contracts with intermediaries, the real and legal persons to whom the merchant, warehouse, processing and similar freight services are carried out. The accredited control and certification body may contract separately for each stage of production, or it may make a single contract by specifying each activity separately (Ministry of Agriculture and Forestry, Turkey, 2018b).

The conversion period is designated by the control and certification body. After the contracts, the control and certification body classifies the producer as "on the conversion period". The period is two years in annual plants, pastures and feed plants; three years in perennial plants. The annual harvest date is taken into consideration for annual plants. The control and certification body may decide whether to extent or shorten the conversion period as a result of land use, applications in the past years, the general conditions of the land and its products, risk situations, entrepreneurial records and reports on the subject. Products obtained after 12 months from the start of organic crop production are categorized, labelled and marketed as "conversion period products". Livestock products from the conversion period cannot include any label expressing or connoting "organic agriculture".

In organic plant production, there are strict rules regarding the use of soil processing techniques which improve the biodiversity of the soil, protect or increase the organic matter of the soil, do not squeeze the soil and prevent erosion. Tillage cannot be done in a way that will cause erosion in the soil.

Conventional products that are not able to be distinguished easily from their organic counterparts cannot be produced at the same facility together unless the producer claims that he/she will convert to organic production within 5 years, or takes precautions to ensure that harvested crops from each unit are kept in separate locations or informs the control and certification body within 48 hours right after the harvest of each product and informs on the different characteristics of both organic and

conventional products and confirms the precautions that are taken to keep them in separate locations.

With regard to soil protection, preparation and fertilizing, the accredited control and certification body decides whether the producer has implemented precautionary actions during the controls. Any use of chemical fertilizers containing nitrogen is forbidden. The seeds must be organically grown and it is forbidden to use genetically modified and synthesized inputs. In case of plant protection; cultural, biological and biotechnical fighting methods should be applied whilst only approved pesticides by the Ministry of Agriculture and Forestry can be used. Drainage waters obtained from industrial and urban wastewater and drainage systems cannot be used in organic agriculture, where decisions are made on controls to be carried out by the authorized body. Moreover, irrigation water should not cause any environmental pollution and irrigation should not lead to degradation and erosion of soil structure. During harvest, the technical tools and equipment used in the harvesting of organic products should not cause ecological damage and pollution. Manual collection materials cannot damage the organic structure of the product and collection materials must be hygienic.

In organic livestock production, local conditions and resistance to diseases are taken into account in the selection of species and breeds as a priority. Animals must be raised in organic farms, fed completely with organic feeds, with unchanged genetic structure and resistant to the environment, climatic conditions and diseases. Natural insemination is essential and embryo transfer is not allowed. Artificial insemination from breeding animals with semen that is obtained stored and used by using natural methods can be applied.

In terms of animal welfare, animals should have access for free range and open air grasslands and areas. Also, the number of animals per unit area must be limited in accordance with the animal manure capacity that is sufficient for the production establishment. It is strictly highlighted that organic livestock must be separately located from conventionally grown livestock. The keeping of animals is prohibited. Animal shelters should be constructed from sanitary building materials, and the conditions of their shelter should meet the biological and racial needs of the animals.

Animals should be easily accessible for food and water. The shelters should be of sufficient size to allow animals to comfortably and naturally relax, easily feed, turn, clean themselves, take all natural positions, and perform all natural movements such as stretching and wing flapping. The floor of the animal shelters should be smooth but not slippery. All mammals must be able to reach grassland or open-air exercise areas or an open shelter area, and animals must be able to use these sites as long as the animal's psychological conditions, weather conditions permit. Besides, herbivores should be able to reach pastures. The birds should be kept under open cultivation conditions and not in cages and their number per production is limited. The minimum cut ages in the wings are 81 days for chickens, 150 days for meat roosts, 140 days for gooses.

In terms of animal feeding, grasslands must have 2-years conversion period, in case of non-herbivores, the conversion period is 1 year for grasslands and production areas. The conversion for organic meat production should be 12 months for cattle, 6 months for sheep and pigs. However, for organic dairy cattle holdings, the period is 3/4 of the life span for animals that are intended for plowing purposes. The regulation clarifies that the period must be 6 months for animals raised for milk production. In meat-producing birds, 10 weeks of age, not greater than three days old, and 6 weeks, in worms for egg production. The feeds should not contain any artificial input. It is forbidden to forcibly feed animals. While choosing breeding animals and species, it is important to look into the animals' adaptation to local conditions, their resistance to diseases and choosing local species is a priority. If the producer cannot provide organically grown feeds, conventional feedstuffs are allowed to be used in limited quantities. Feedstuffs containing livestock produce, mineral, vitamins, pro-vitamins, enzymes, preservatives, microorganisms, binders, anti-aging agents, antioxidants, silage additives and products used in animal nutrition and auxiliaries in feed processing can be applied if they are included in the legislation. It is important to note that antibiotics, coccidiostatics, medicinal substances, or other substances that increase growth or production cannot be used in organic livestock production and feedstuffs, additives and any other products used in animal feedings cannot contain any GMOs.

There are also standards for organic feedstuffs as they must be produced separately from their conventional counterparts, labeled with detailed information. In

case of insufficient organic livestock, conventional livestock can be used if chicks are not older than 18 weeks for egg-production and broilers are not be older than 3 days after leaving the farms. For meat production all animals must be raised organically after they cut from milk and must be not older than 6 months for icebergs and foals, 60 days for lambs and goats, weighted less than 35 kg for pigs. If no organically produced animals are available for crawling and / or shed renewal, maximum 10% of the adult cow and 20% of the pigs and cow may be brought in from conventional production sites with the approval of the authorized body each year. In these cases, the animals' health records must be controlled.

In case of animal diseases, instead of chemically synthesized veterinary medicinal products, herbal medicines such as herbal extracts and plant extracts, probiotics, organic acids, plant, animal or mineral origin, trace elements and products, and homeopathic preparations may be used. If homeopathic and herbal treatment are not efficient, chemical medicines or antibiotics may be applied under the provision of the control and certification body. All the treatment process must be recorded. In case of vaccines and other treatments, any livestock treated by chemical medicines twice a year cannot be used in organic livestock production. All of these rules are explicitly given in the legislation. The rules for organic aquaculture and bee hives are based on similar rules.

In organic production, processing and labeling are key factors that differentiate organic products from their conventional counterparts. Similar to EU and US legislations, methods including ionic-radiation is not allowed. Similar to the production process, no use of GMO-based products can be applied and the organic authenticity of products must be preserved in the processing. The organically labeled products must include certification status, the authorized control and certification body's information, harvest year, production year, the producer's name, state organic logo for internally marketed products, ingredients, origin, and Turkish label information for imported products. As stated previously, the product name must contain "organic"; in addition, the law permits the use of the terms "ecological" and biological" as they are considered equivalent to "organic". The design of labels must be different from that of conventional products. Products of conversion period must

be labelled in accordance with the format designated by the Ministry of Agriculture and Forestry and they cannot have the state organic logo. Conventional products cannot be marketed with prefixes like eco, bio, org due to prevent unfair competition and misleading information for consumers. For processed products, minimum of 95% must consist of organic products except salt and water. If conventional products include organically grown ingredients, they can be labelled as "produced with organic farming methods with X%". The use of conventional substances and additives is clarified. In storage and transportation, hygienic conditions and precautions to prevent any damage to the organic nature are clearly described in the legislation.

Control and certification bodies must be accredited by the Ministry of Agriculture and Forestry. There are currently 35 accredited bodies in Turkey. Some of them are branches of international certification institutions, whereas others are national. All these bodies work within the framework of the rules required by organic farming law. Each body has a management system including fees, examples of certification documents, methodology of testing, inspecting, analyzing, techniques applied and information on documentation. The control and certification body inspects the producer at least once a year on site with or without warning. Bodies should have hired at least one controller and one certifier; they should be objective and independent; and their accreditation lasts for 2 years. In case of suspicion on application of production techniques and inputs that do not comply with the provisions of the regulations, samples of products may be taken. These product samples are analyzed in accredited laboratories. The control and certification bodies are also controlled by the Ministry of Agriculture and Forestry and its district units. There are financial penalties that are carried out in case of violation of the law (Ministry of Agriculture and Forestry, 2004).

In the administrative side, the organic agriculture committee has the decision-making power. The duties of the committee are authorization or revoking authorization of accredited organizations, and proposing any menace and necessary administrative fines in case of violation of the organic agriculture legislation by the authorized institutions and the producers. In addition, National Directing Committee of Organic Agriculture consists of several government representatives from different ministries,

government institutions, the European Union General Secretariat, Scientific and Technological Research Council of Turkey, professional organizations, NGOs, universities and private sector. This committee carries out studies on the implementation and development of organic agriculture, supports and incentives, awareness of the consumers, marketing of organic products in Turkey and abroad, identification of problems in implementation and determination of strategies in this field, project proposals on organic agriculture and research priorities (Ministry of Agriculture and Forestry, 2018c). Figure 1.31 shows the flowchart of Turkish organic farming system.

.

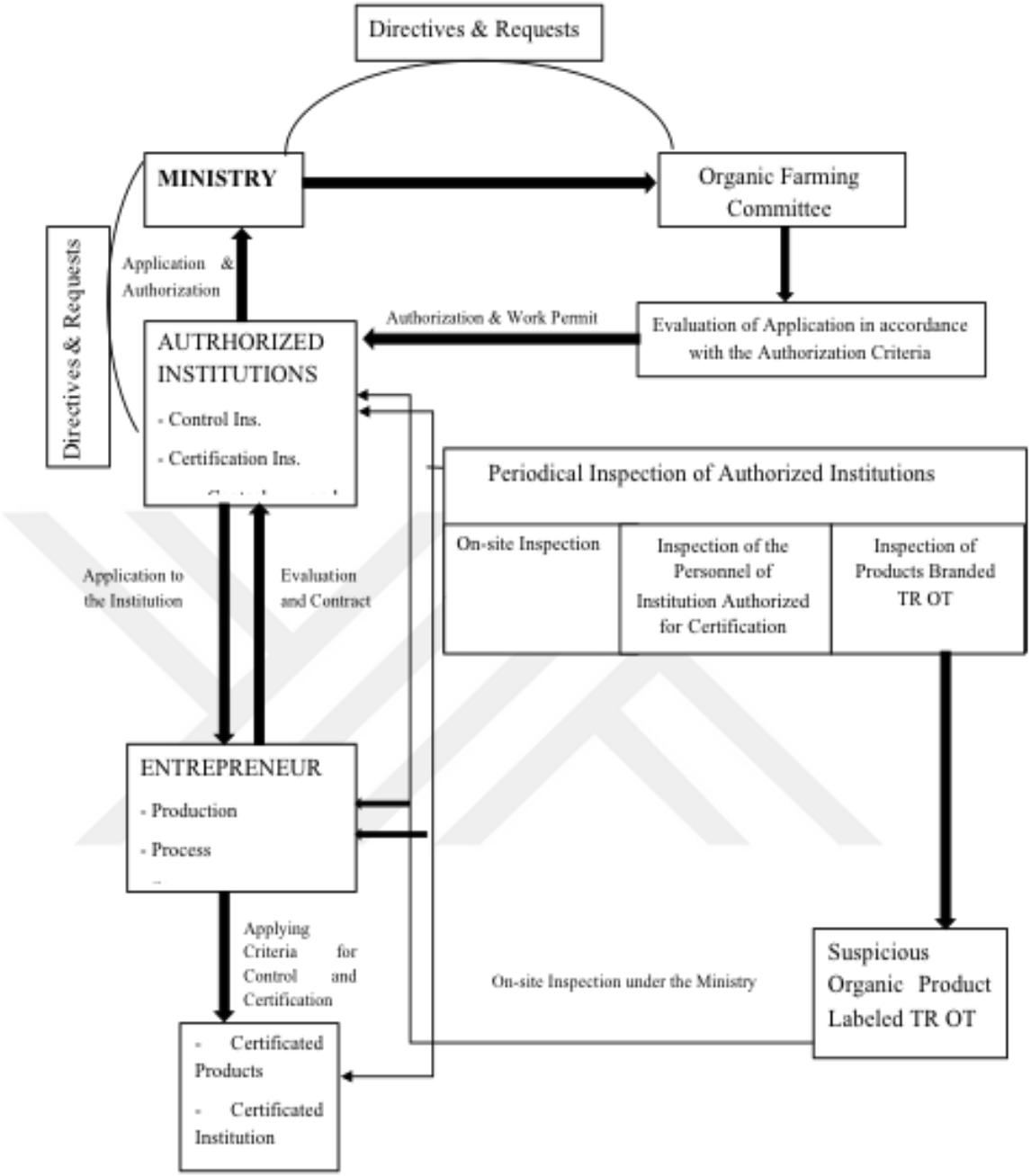

Figure 1.30 Flowchart of Turkish Organic Farming System[44]

[44] Source: The Ministry of Agriculture and Forestry, Turkey, Official Website: https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Yurutme-Izleme, 2018.

1.13.1. Organic Agricultural Government Supports in Turkey

There are several governmental supports for organic production in Turkey including subsidies, reduced interest rates, low interest loans from state owned bank (Ziraat Bank), direct payments per area. To benefit from these, it is mandatory to be a certified producer or farmer. Direct payments are categorized in accordance with four types of products. 1st category is for organic fruit and vegetable production and producers in this category may have payments as 100 TRY per decare. In the 2nd category, producers of organic medical and aromatic plants may benefit from payment of 70 TRY per decare. The 3rd category consists of organic field crops with economic value and producers may be paid 30 TRY per decare. In the last category, producers of organic field crops with no economic value, forest-like products, and organic lands in fallow may benefit from payments of 10 TRY per decare (Table 1.10). In addition, the decision on "Supporting the Manufacturers Who Prefer to Protect Environmentally-Friendly Agricultural Resources" No. 2011/1573 provides payments of 135 TRY per decare for producers applying eco-friendly agricultural techniques and cultural practices (Ministry of Agriculture and Forestry, Turkey, 2018d).

Table 1.10 Government Financial Aids for Organic Plant Production, 2017[45]

Support Category	TRY per decare
1st Category (Fruit and Vegetables)	100
2nd Category (Medical and Aromatic Plants)	70
3rd Category (Field Crops with Economic Value)	30
4th Category (Field Crops with no Economic Value, Forest-like Products, Fallow)	10

[45] Source: Ministry of Agriculture and Forestry, Turkey Official Website: https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Destekler, 2018.

In financial funding, field-based supports take a crucial place in Turkish organic agriculture. Table 1.11 exhibits the government support for field-base payments between 2006 and 2017. As of 2017, government has supported more than 129 Million TRY in field-based supports. The number of producers who benefited from this support has increased almost 45 times in 12 years. It is also important to note that more than 63% of organic producers has benefited from this area payment. We also see that supporting unit payments have risen since 2017.

Government supports for organic livestock production in Turkey is demonstrated in Table 1.12. It is seen that the total support is 3,435,019 TRY between 2012 and 2017. In 2014, the highest amount of payment has been made. However, in 2017, the amount of payments sharply decreased. The statistics show that supports per animal head, organic beehive, organic holding are volatile in years. There is also a direct payment for organic beekeeping activities, as producers may be paid 10 TRY per beehives.

Another important government support is low-interest loans in organic agriculture. The organic farming law indicates that organic producers may apply for 50% discounted operating and investment loan from the current interest rate. Table 1.13 represents that 8846 organic producers have utilized low-interest loans that account for 593.4 Million TRY. In spite of this, the number of producers who have benefited from the loans are very low compared with total number of organic producers in Turkey.

Infrastructural supports in organic agriculture are substantial since the organic production has been developing in Turkey. There are research oriented supports such as Decision Regarding Agricultural Supports (2017/10465) which intends to promote the dissemination of environmentally sensitive agricultural production, recommend biological and biotechnical struggle as an alternative to chemical struggle against the diseases and harmful organisms threatening plant production, enhance the efficiency and the quality, ensure the effectiveness of applied policies, contribute to the solution of sectoral priority problems, keep the agricultural records up to date and implement research and development projects for five years (Official Gazette, Turkey, 2017). In

R&D, there are several projects and supports provided by General Directorate of Agricultural Researches and Policies in Turkey (TAGEM). Some of these projects are implemented with cooperation of EU and TUBITAK. TAGEM also aims to set up a research center for energy and agriculture by promoting R&D activities to develop biofuels and related technologies, a gene bank to preserve biodiversity, a plant biotechnology center and an animal biotechnology center to conduct biotechnology studies (Ministry of Agriculture and Forestry, 2014). Besides, several database systems to keep record and track certified organic producers and production quantities such as "Organic Agriculture Production System" (OTBIS) and "Farmers Registration System" (ÇKS) and for livestock producers TURKVET, "Beekeepers Registration System" (AKS), are available to construct transparency and perfect information in the market. Moreover, the state media (TRT) is obliged to promote organic production by broadcasting informative and educational programs 30 minutes per month (Ministry of Agriculture and Forestry, Turkey, 2018d).

Table 1.11 Organic Agriculture Supports (Field-Based Supports)[46]

Years	Number of Producer	Area (decare)	Supporting Unit Payments in TRY/decare	Value in TRY (TL)
2006	1,042	43,758	3	131,275
2007	1,536	117,188	3	351,564
2008	1,615	130,747	5	653,732
2009	5,467	368,581	18	6,634,464
2010	4,976	351,825	20	7,036,497
2011	23,575	2,423,983	25	60,599,577
2012	28,045	2,711,899	25	67,797,484
2013	26,763	2,515,068	Fruit and Vegetables /35 Field Crops /10	37,495,564
2014	32,037	2,966,847	Fruit and Vegetables /70 Field Crops / 10	68.354.404
2015	38,778	3,247,585	Fruit and Vegetables /70 Field Crops / 10	87,859,273
2016	27,562	2,522,631	Fruit and Vegetables /70 Field Crops / 10	57,877,494
2017	47,557	3,564,006	4th Category (Field Crops with no Economic Value, Forest-like Products, Fallow)/ 10	129,715,461

[46] Ibid.

Table 1.12 Government Supports for Organic Livestock Production[47]

Years	Brood stock	Calf	Sheep & Goat	Beekeeping from disease	Beekeeping	Number of Holdings	Support
	Head Number				Number of Organic Beehives	Total Number of Holdings	Total Organic Support Value in TRY
2012	1,213	0	196	0	1,344	45	142,637
2013	1,236	362	1,713	697	41,282	322	414,711
2014	3,532	742	34,438	0	11,498	540	968,750
2015	3,694	986	7,393	0	19,697	300	775,815
2016	4,103	892	16,227	0	17,951	280	912,075
2017					22,059	192	221,031
Total						**1.679**	**3,435,019**

[47] Ibid.

Table 1.13 Loans for Organic Producers, 2004-2016[48]

Years	Number of Producers	Value in TRY
2004	116	3,413,000
2005	273	7,069,000
2006	545	15,866,000
2007	681	19,561,000
2008	824	24,553,000
2009	704	31,755,000
2010	1,830	69,473,000
2011	1,274	27,370,000
2012	289	20,821,000
2013	276	52,173,545
2014	308	60,319,343
2015	877	73,507,052
2016	576	68,470,375
2017	203	94,438,893
2018 (as of April)	72	24,647,770
Total	**8,848**	**593,437,978**

[48] Ibid.

1.14. THE IMPACT OF INSTITUTIONS AND NGOS IN TURKISH ORGANIC FOOD MARKET

Organic food market and agriculture are still developing in Turkey. There are approximately 21 NGOs that put noteworthy effort in the development of organic agriculture and food market in Turkey. As mentioned earlier, Ecological Agriculture Organization (ETO) is one of the first NGOs in this field and it has organized several congresses in cooperation with Ministry of Agriculture and Forestry and universities since 1999. Aegean Exporters' Association (EIB), Bugday Association for Supporting Ecological Living are among forthcoming NGOs.

Organic Product Producers and Industrialists Association (ORGÜDER) is an NGO that focuses on organic producers and their problems, whereas a newly established NGO, Control and Certification Bodies Association (KSKDER) concentrates on constraints and development in control and certification fields in the market. Bugday Association for Supporting Ecological Living acts like an agent in liaison between organic farmers and consumers, it contributes to construct and develop farmers' and ecological bazaars in several cities. The NGO controls farmers in terms of certification and prices. The NGO supports and sponsors several workshops, meetings and gives information on organic, ecological agriculture, food production, food security and sustainability. Table 1.14 gives a detailed information on NGOs in organic agriculture in Turkey.

Ege University has substantial works and projects on organic agriculture in Aegean region. The institute of the university provides practices for organic agricultural activities with local farmers, technical support in the area. There are also several province and district organic agricultural offices of the Ministry of Agriculture and Forestry which contribute to promote and give information on organic agriculture.

Moreover, there are several projects of these offices targeting to prevent consumer misperception about organic products. It is noteworthy to mention about the common press release of 21 NGOs in food security, organic agriculture and food market. The release has been made in April 2018 and it addressed the misperception and misinformation about the penalties given by the Ministry Agriculture and Forestry to organic producers. In the announcement, NGOs explained that there was a misunderstanding about the causes of these penalties as public and mass media commented as penalties were given to mislabeled organic products and fraudulent acts in the sector and questioned the food security in organic production. They highlighted that the majority of these penalties were addressed to entrepreneurs that had problematic documentation and notifications. In the release, they also explain and clarify inspections and methods used in organic production.

Regarding the statistics, Turkey's share in organic food market remains behind many developed countries. In terms of NGO and institutions, there are several progress but Demiryürek et al. (2008) explain that institutions do not provide grants, education, training activities for organic farmers and research and development activities in organic agriculture at an adequate level. They also imply the lack of cooperation between public and private institutions and NGOs and criticize farmers' organizations due to their limited supports.

Table 1.14 NGOs in Organic Agriculture in Turkey

Name of NGO	Activity Field
Bugday Association for Supporting Ecological Living	Information for consumers about organic authenticity, organization and sponsoring ecological bazaars, meetings with ministry representatives, campaigns about the difference between natural and organic on social media and across Turkey
Ankara Organic Producers and Entrepreneurs Association	Information and consultancy for organic producers on policies, technical issues, projects on organic and sustainable agriculture
Çukurova Organic Agriculture Association	Enhancement of organic agriculture in rural areas, sponsoring ecological bazaars in Çukurova region
Eastern Anatolian Agricultural Manufacturers and Breeders Association	Projects on dissemination of organic production such as breed and dairy products in Eastern Anatolian region, collaborations with government institutes and international organizations like IFOAM
Ecological Agriculture Organization Association	Information on organic agriculture and products for consumers, providing legislations, list of allowed substance, online training on organic agriculture, membership for producers, collaborative projects with EU and international entities, meetings, symposiums, conferences with ministry representatives and organic producers, sponsoring ecological bazaar in Izmir, regional branches across Turkey
Ecological Living Association – Bursa	Enhancement of ecology, sustainability and promoting organic products across Bursa and Marmara region
Erzurum Organic Trusted Food Producers Association	Organic producer association in Erzurum
Southeastern Anatolian Project Organic Cluster Association	Information on organic products, producers, cluster in Southeastern Anatolian region, technical guideline on organic production, projects and service in marketing of organic products in collaboration with other institutes in the region
Cappadocia Organic Agriculture Manufacturers Association	Education and training programs, consultancy for organic producers in Capadoccia and Kayseri
Kirazlı Ecological Living Association	Projects to spread organic agricultural practices, preserve bio-diversity and local seeds in collaboration with UN, sponsoring organic bazaar in Kirazlı village

Kocaeli Ecological Living Association	Information for consumers about ecological agriculture and products, sustainability, providing a platform to bring together organic producers, supporting for local ecological bazaars, discussion forum
Control and Certification Bodies Association	Bringing together accredited control and certification bodies in Turkey functioning in organic agriculture and good agricultural practices, organizing workshops for the enhancement of organic agriculture and food market
Konya Organic Agriculture Association	Spreading Organic agricultural activities in Konya and contributing consumer awareness on organic products, meetings with government district units and offices
Mersin Organic Banana Producers Association	Promoting organic banana in Turkish domestic market, working on the enhancement in organic banana production in Mersin
Niksar Organic Fruit Producers Association	Promoting organic fruit production in Niksar region, providing education on organic agriculture in nearby villages, bringing together organic farmers in the region
Organic Sustainable and Good Agriculture Organization Association	Providing articles, releases, publications on sustainability, organic agriculture and good agricultural practices and related policies and projects in this field, information on organic producer associations, discussion forum for visitors as an online platform
Organic Product Producers and Industrialists Association	Providing a platform that brings together organic producers and manufacturers across Turkey, information on techniques in organic agriculture, policies, marketing options for organic products, contributing to enhance consumer awareness on organic products
Organic Life Association	Supporting ecological living, organic producers, sponsoring local organic bazaars, meetings with other NGOs
Sürmeli District Association Organic Producers	Sponsoring farmers' market in Sürmeli district, bringing together organic producers in the district

Ulupınar Environmental Protection Development and Operation Cooperative Organic Producers	Supporting organic agricultural practices, sea turtle conservation studies, endemic plant marking and conservation efforts, marketing a wide range of organic and locally grown products in Kemer, Antalya
Yeryüzü Association	Conducting projects on sustainable living such as "City Gardens" to promote sustainable agricultural practices in urban areas and ecological villages across Turkey, collaborative and volunteer works on sustainability

1.15. CONCLUSION

Organic agriculture and food market has become a more dynamic and growing sector. This chapter aims to give a detailed information on the creation of the organic agriculture and food market regarding its principles, history, benefits, advantages and disadvantages, relation with sustainability, production process, supply and demand sides. Thus, the chapter focuses on a comparative analysis of organic food market in the world, US, EU and Turkey in terms of overlooks to agricultural, livestock, aquaculture and apicultural productions, retail sales volumes, policies and impact of institutions and NGOs.

The aim of the chapter is to understand the organic food market from a wider perspective, Organic agriculture and production system have aroused in 1970s as an alternative to industrialized agriculture. Regarding the principles, benefits and advantages of organic agriculture it is possible to argue that organic agriculture and food products are a healthier and a more environmental-friendly alternative for conventional agriculture and produces. As a sustainable food system, organic food products attracts consumers who have concerns about health, environment, nutrition. Organic production is also linked to sustainability and offers a solution for world hunger. Besides its benefits and advantages, organic agriculture is criticized as it has become a corporate sector, it has some negative impacts in terms of bacterial contamination, and longer mileage.

Organic production system consists of several rules and standards. In this chapter we have precisely explained the production process, distribution channel and constraints in the supply side of organic food market. Organic production starts with a conversion period in which land and all inputs are analyzed by a authorized control and certification body and any input consisting of GMOs, artificial fertilizers, etc. are not permitted. After the conversion period, annual inspections and analysis of products and soil are made regularly. In the distribution channel, farmers' market is an example

of direct channel where consumers meet the producer; whilst indirect channel has been developing since retailers have been involved in the organic food market. The chapter briefly gives information on constraints in the supply side and motives and barriers in the demand side of the organic food market. A more detailed analysis will be given in Chapter 2 and 3.

Regarding organic agricultural, livestock, aquaculture and apicultural productions, retail sales volumes, policies and impact of institutions and NGOs. A comparative analysis has been made. Organic food market has a sale volume of 90 Billion USD globally. US and EU are the biggest markets, whereas Australia and Oceania has the largest organic agricultural lands. In comparison with US and EU, organic food market remains small in Turkey. US has 46.3 Billion USD of sales, while it is only 90 Million USD in Turkey. In organic livestock production, livestock production and head numbers are also behind the developed countries. It is noteworthy to mention that statistics and data for organic food production and retail sales are not available in Turkey, which makes an evaluation of the market very difficult. Furthermore, we have seen volatilities in the production numbers and loans provided for organic producers. Organic aquaculture production is very low and it has not developed yet. Turkey has suitable lands and conditions for organic agriculture and food production, there are improvements to be made in order to develop this sector..

Organic agriculture policies and standards are reference points. In terms of organic standards, we see that there are standards of national governments and international organizations such as IFOAM and Demeter. It is seen that standards made by international organizations are more stringent than national standards. There are differences between policies and standards in terms of allowance of methodology, substance and additives. While we look into policies, Turkish organic farming act was conducted in compliance with EU's act. Turkish law clarifies the separation of conventional and organic products in the production and processing more severely. EU organic farming act mentions about the training of personnel in organic livestock holdings more clearly. In addition, it is important to highlight that US' act classifies organic products in terms of their organic share in more detailed way, whereas Turkey and EU only categorize them as organic if they consist of 95% of organic ingredients.

Besides these differences, all three standards are based on organic principles and no use of artificial inputs, strict controls and rules. It is noteworthy to say that Turkish organic farming act was designated in compliance with EU. Turkey should adopt adjustments in the current organic agriculture legislation as EU will implement a new legislation aiming to conduct a more uniform and simpler standardization process. EU is an important export market for Turkish organic producers, so that in order to be placed in the EU third countries list which allows Turkish organic firms export options to EU member countries, several adjustments be made in organic food policy.

In order to have a better understanding, this chapter looks into the impact of institutions and NGOs on the organic food market., There are several institutions and NGOs providing information, technical knowledge, discussion fora, statistics, publications, conferences, meetings worldwide. In US and EU, there are several institutes that are linked to universities conducting scientific research and some NGOs promoting grants for organic producers. In Turkey there are institutes at universities. There are approximately 21 NGOs that mostly function in consumer information, organization of organic bazaars and markets, and gathering producers. Overall, we see that both demand and supply of organic agriculture and food market in Turkey has not reached to a satisfactory level and remain behind those of developed countries. For these reasons, the thesis focuses on understanding the problems and suggesting solutions to the constraints, barriers in the sector. In the recent media releases about the financial penalties in organic food market, they have a common announcement in order to inform public about the reason for penalties and explain the organic production structure.

2. ORGANIC FOOD DEMAND IN TURKEY

2.1.INTRODUCTION

The demand for organic food products has increased and organic food is becoming an important sector rising from food industry worldwide. There are 178 countries conducting organic agricultural activities and the market size is more than 80 Billion USD with main contributors US and EU (FIBL and IFOAM, 2018). In Turkey, the demand for organic food has followed a similar growth pattern, as the retail sales have increased in the same period. Turkey have become the leader in exporting dried fruits like raisin, apricot and nuts. The organic packaged food market has enlarged to 90 Million USD in 2015 and it is estimated that it will reach 170 Million USD in 2020 as USDA (2016c) suggests. USDA also shows that organic packaged food sales have increased by 24% in 2014 and it is estimated to have increased by 50% in 2015. Researches express that Turkish organic food demand is increasing (Tetik, 2012). USDA (2016c) suggests that the reason behind the growth in the demand for organic packaged food are urbanization, increased knowledge and awareness about organic food and economic development. Several researches state that the growth of organic demand in Turkey is related to increasing health concerns and food safety (Ak, 2002).

Recently, organic products have been more demanded by the domestic market but the awareness about organic food is still limited (USDA, 2016c) and has not reached to its potential (Ilter and Yilmaz, 2016). Besides, there are improvements in the market and organic food purchase is more available through organic open bazaars in many big cities, organic specialty shops, organic shelves and stands in numerous supermarket chains as a result of increased number in organic food brands in the

domestic market. Farmers with organic produce are more frequent in bazaars and many organic produce farmers sell their products online.

As the organic food market is still spreading worldwide, many researches focus on profiling organic produce consumers, looking into motives and barriers affecting the demand. At first glance, we can point out three obstacles for the growth of organic food market in Turkey. First, the organic food prices are higher than conventional food prices as FAO claims (FAO, 2018c). FAO also indicates that expensive prices of organic food products rather than their conventional counterparts are relied to many reasons such as higher production costs, limited organic food supply due to low organic food demand, other higher costs caused by post-harvesting, distribution channels, transportation, animal welfare and environment protection. This difference of price can be an obstacle for the growth of the demand as Turkey is a developing country and its organic food market develops at a slower rate than other developed countries in the world (Tetik, 2012). The USDA Report claims that organic food products are considered as luxury foods. Second, lack of education may also prevent people from understanding the value of organic food. The report also suggests that people with higher education and higher income living in big cities tend to consume more organic food. Third, labelling and awareness of organic food certificates constitutes another problematic issue. We know that organic products are differentiated by their certificates from conventional products. We have to make sure that consumers are aware of this certification process and labels. However, USDA (2016c) shows that most consumers do not distinguish organic food products from their conventional counterparts. The organic food market is thus characterized by an imperfect information structure.

In this chapter we aim to reveal the organic food consumer profile in Turkey and describe the obstacles preventing the growth of organic food sector. First, we will study the theoretical and empirical literature on organic food demand then we will present our hypotheses on organic food demand. Second, we present the survey that we have conducted in three largest cities in Turkey to test these hypotheses with the

related descriptive statistics and follow with our econometric model. Third, using survey results on price comparisons between organic and conventional food products, we derive organic food demand curve to analyze the characteristics of this demand. The results show that Turkish organic food demand is segmented with one segment still conceiving organic food as a variety in the food market and the other aware of the value added it provides. The last section presents with the discussion of the results.

2.2.LITERATURE REVIEW

Consumers may be interested in many aspects of the food including nutrition, food safety, value (taste, freshness and appearance), packaging and process. The first three characteristics are directly related to the consumption of the food itself and the fourth and fifth are related to the impact of this consumption on environment. Consumers may be interested on one or more than one of these aspects of the food they are consuming. The purchase of organic food is motivated by the belief in its higher quality (Magkos et al., 2003). Beck et al. (2012) use expert knowledge and classify the quality of organic food products into the categories of nutrition, health, sensory properties and ethical properties (ethical attributes may include fair trade or animal welfare as well). The first two categories define the basic value of the product and the last two attributes can be referred to as the added value.

Products are also categorized through search, experience and credence characteristics. In case of organic goods, as consumers cannot distinguish the final organic and conventional goods without their labels, credence is especially important for organic products and means of verifying credence such as certification play a crucial role for the efficient functioning of the market. Experience characteristics such as taste are attributes grasped after consuming and experiencing the good and search characteristics such as appearance can be ascertained before purchasing and consuming. Following Harris et al. (2000), we have classified factors affecting the demand for organic food in three categories: socio-demographic, economic factors and factors related to consumption.

2.2.1. Socio Demographic Variables

Socio demographical characteristics can affect organic food demand.

2.2.1.1.Age

As Fotopoulos and Krystallis (2002) explains, there are varying results on the relationship between organic consumption and age. For example, in the UK, Geen and Firth (2006) and Mintel (2000) find that organic food consumers tend to be elderly or middle aged people; Xie et al. (2015) find that Chinese organic food consumers are mostly old. But, Magnusson et al., (2001), Arbindra et al. (2005) and Dettmann and Dimitri (2010) show that elderly consumers do not regularly buy organic products and young people have more interest in organic food. Davies et al. (1995) and O'Donovan and McCarthy (2002) claim that age does not play an important role on organic consumption.

2.2.1.2.Gender

Many studies express that women tend to be more anxious about environment, ecological issues, hence they are more likely to consume organic food products (Lea and Worsley, 2005; Lockie et al., 2002). Aertsens et al (2009) relate the fact that women tend to consume more organic food than male consumers to their higher awareness about food safety, environmental issues. In Turkey, women find organic food products as safe and tend to consume more (Sarıkaya, 2007; Oraman, 2014).

2.2.1.3.Education.

Numerous studies suggest that education level is positively correlated with organic food demand (Jolly, 1991; Ellen, 1994; Govindasamy and Italia, 1999; Storstad and Bjorkhaug, 2003; House et al., 2004; Gracia and De Magistris, 2007; Stobbelaar et al., 2007; Xie et al., 2015). Xie et al. (2015) add that consumers with low education level are less likely to hear about organic agriculture. Similarly, in Turkey, consumer with higher education concern more about environmental friendly products

as Sarıkaya (2007) expresses. Several other studies find a negative relationship between education and organic food consumption (Byrne et al.,1991; Buzby and Skees, 1994; Thomson and Kidwell, 1998). Arbindra et al. (2005) and Aertens et al. (2010) do not find any significant relationship between education and organic consumption.

2.2.1.4.Marital Status

Lea and Worsley (2005) explain that married women have a role as household food purchasers and they buy more organic food products. Tung et al. (2015) propose that married couples have a tendency to purchase organic food products. There are also studies expressing that single consumers have a higher tendency to purchase organic food products (Jolly, 1991; Harris et al., 2000).

2.2.1.5.Children

Many researches state that families with children are more willing to buy organic food (Davies et al., 1995; Sanders and Richter, 2003; Tsakiridou et al., 2008; Aertens et al., 2009) and households with children under 18 consume more organic food products (Thompson and Kidwell, 1998; Devine et al., 1998; İlyasoğlu et al., 2010; Tung et al., 2015). Hill and Lynchehaun (2002) claim there is a high demand for organic baby food and Falguera et al. (2012) explains that in 2009 there were an overall decrease in organic food products except organic baby food. Tsakiridou et al. (2008) find, on the other hand, that household size is not a significant factor determining organic demand.

2.2.1.6.Occupation

In the literature, there are limited studies analyzing the impact of occupation on the organic food demand. Chen et al. (2010) and Xie et al. (2015) propose that organic food consumers in China are mostly office workers. In Turkey, Kenanoğlu and Karahan (2002) indicate that unemployment is an important factor for limited organic

food demand and Çelik (2013) indicates that organic produce consumers are mostly public officers and housewives.

2.2.1.7.Household size

Household structure, such as marital status, family size, is an important variable to profile organic food consumers. Tsakiridou et al. (2008) explained that household size is not a significant factor determining organic demand, whereas, Harris et al, (2000) claim that there is a negative correlation between household size and organic food demand as household disposal income decreases when number of people in the household increases.

2.2.2. Consumption Variables

2.2.2.1.Psychographic Variables

In order to understand the factors affecting the demand side, it is crucial to analyze behavioral aspects influencing the decision making process in the purchase and consumption of organic food (Hamzaoui-Essoussi and Zahaf, 2012). Consumers tend to purchase not only necessary food products but also products satisfying their psychological well-beings (Falguera et al., 2012).

Several scholars explain that value theory and the theory of planned behavior are important frameworks to analyze the organic food consumption (Gracia and De Magistris, 2007; Gotschi et al., 2007; Thøgersen, 2007). The value theory is constructed by Rokeach in 1973 and by Schwartz in 1992 and it links values and consumer behavior. From 1990's on, as research on organic food consumption have increased, the value theory has become popular (Aertsens et al., 2010). Krystallis et al. (2008) state that values have powerful impacts on the cognitive system and they remain stable over time. Schwartz (2006) has implemented ten categories when he defined the value theory; these are commonly used to indicate the relationship between values and behaviors of organic food consumers. In terms of organic food

consumption, the value of security reflects health and food safety concerns of organic food consumers (Zanoli and Naspetti, 2002). Many studies show that there is a significant correlation between organic food purchase behavior and health-consciousness (Magnusson et al., 2003; Stobbelaar et al., 2007; Lea and Worsley, 2005). Hedonism refers to pleasure and in terms of organic food consumption it is related to having fun, well-being, pleasure and enjoyment from the taste of organic fresh food. According to studies in Greece and Italy, there is an increase in hedonism while consumers purchase organic food products. (Krystallis and Chryssohoidis, 2005; Zanoli and Naspetti, 2002). Stimulation expresses excitement, tendency for novelty, challenges in life (Aertsens et al. 2009). Aertsens et al. (2009) postulate that this value is related to "Exploratory buying behavior tendency"; and it has been found that this tendency is very high among organic food consumers in Greece and Italy (Krystallis and Chryssohoidis, 2005; Chinnici et al., 2002). Universalism represents environmental consciousness while looking into organic food consumers' perceptions of organic. Many scholars state that universalism and benevolence are the most superior values for regular organic food consumers (Magnusson et al., 2001; Krystallis et al., 2008; Zanoli and Naspetti, 2002; Padel and Foster, 2005). Several other studies have found that there is a positive relationship between environmental consciousness and organic food perception (Magnussen et al., 2001; Padel and Foster, 2005; Hill and Lynchehaun, 2002). On the other hand, Baker et al. (2004) found that British consumers did not make the connection between environmental consciousness and organic food consumption. Benevolence expresses being selfless, tendency to act kindly regarding others' welfares. For organic food consumers, the literature relates it with supporting local economy while purchasing organic food products. However, the findings on the value of benevolence and the organic food purchase is not so strong (Padel and Foster, 2005). Self-direction refers to independency while acting and during decision making process along with exploration, choosing. Aertsens et al. (2009) explain that consuming organic food products can reflect a "*positive self-image"* and "*a different identity*" for organic food consumers from others. Several studies on organic food consumption link the value of self-direction with "*doing something good in life"* or *self-respect"* while consuming organic food products (Krystallis and Chyrssohoidis, 2005; Stobbelaar et al., 2007). The value "power" represents social status, control, prestige, dominance (Aertsens et al., 2009). Dreezens et al. (2005) show

a negative relationship between the value power and organic food perception, given that there is a positive relationship between power and food product with GMOs.

The Theory of Planned Behavior (TPB) is proposed by Ajzen (1991), and it relates a person's belief to his/her behaviors. TPB also states that intentions are driver forces of specific behaviors of the individual as Sparks and Shepherd (1992) point out on food choice. Recently, studies on organic consumer behavior refer to TPB and highlight the impact of intention on organic food purchase behavior (Saba and Messina, 2003; Gracia and de Magistris, 2007; Irianto, 2015). TPB lies on three concepts *(1) attitudes, (2) subjective norms and (3) behavioral control.* As Ajzen (2006) explains, perceived social pressure can be considered as subjective norms, thus an individual can be influenced by his/her family, friends' behaviors. In terms of organic food consumption, several studies find a positive relationship between subjective norms and intention of consumers (Chen, 2007; Dean et al., 2008; Irianto, 2015). In addition, Tarkiainen and Sundqvist (2005) found that subjective norms indirectly affect the intention of buying organic food through attitude formation. We have selected following parameters as the measure of these personal attributes.

Health issues are important in organic consumption as organic production aims to produce food products without use of any synthesizers that may have negative consequences for health (FIBL, 2015)[1]. Existing literature shows a relationship between health consciousness and organic food consumption and proposes that attributes towards health are crucial for organic food demand (Lea and Worsley, 2005; De Magistris and Gracia, 2007; Falguera et al., 2012). As explained earlier, the risk of exposure to antibiotic-resistant bacteria and pesticides residues is less likely while consuming organic food as Smith-Spangler et al. (2012) postulate. Harper and Makatouni (2002) explain that both free-range and organic food products are perceived as healthier for human health. In Taiwan, the fact that a person or a family member is diagnosed with a disease or infirmity has a significant relevance with individual consumption of organic food (Tung et al., 2015). Similarly, in Serbia, organic food

[1] Source: FIBL, "Background to the quality of organic products report", FIBL Official Website: http://www.fibl.org/en/themes/lebensmittelqualitaet-sicherheit/facts-about-the-quality-of-organically-produced-food.html, 2015.

consumers strongly value the importance of diet for health and some having a closer person diagnosed with a disease believe that a proper diet can prevent the illness (Grubor and Djokic, 2016). In Turkey, there is an increase in organic food demand as consumers regard them healthier than conventional produce (Sarıkaya, 2007).

Environmental debates have been made worldwide since 1960's in the US and 1980's in Europe continent (Greenan et al., 1997; Klonsky and Tourte, 1998). Ethical debates have risen in the world in the 20th century in terms of maintenance of resources and environmental awareness. It is possible to argue that the organic demand has risen in Europe and US as ethical consumerism has become more popular in developed countries since 1990's (Krystallis and Chryssohoidis, 2005). Environmental concerns motivate organic consumption (Harris et al., 2000; Xie et al., 2015; Makatouni, 2002). Consumers mostly believe that organic production have advantages in terms of environmental issues and animal welfare (Timmins, 2010). Jolly and Norris (1991) indicate that the sellers of organic products state that environmental issues are among important factors triggering the demand. In addition, Nemecek et al. (2016) show that any diet consisting over 75% organic food has lower environmental impact. Even though environment and animal welfare are mentioned motives when it comes to organic consumption, researches suggest that those motives are ranked below health, quality, taste and freshness (Millock et al., 2002; Fotopoulos and Kryskallis, 2002; Zanoli and Naspetti, 2002). Tregear et al. (1994) show that both organic and non-organic consumers have environmental awareness; it does not differentiate consumers in terms of organic consumption in UK.

Nutrition is the main motivation behind food consumption. According to Hartman Group (2002) and Dettmann (2008), nutritional values are among main drivers to choose organic products. Consumers prefer to buy organic food stating that these are healthier and rich in nutritional values for children even though it is not scientifically proven (Hutchins and Greenhalg, 1997). There are also studies showing contrary results finding that nutritional values do not play an important role to motivate consumers to buy organic produce (Egberg Mikkelsen, 1993; Conklin and Thompson, 1993).

2.2.2.2.Sensory Variables

Senses are important motivators in food purchasing (Krystallis and Chryssohoidis, 2005) and variables such as taste, appearance, freshness and shelf life are important specifications for organic food products.

Several studies state that organic products taste better than conventional products thus consumers are driven to buy organic produce to have better taste (Hartman Group, 2002; Çelik, 2013; Tregear et al., 1994; Grunert and Juhl, 1995; Davis et al., 1995; Roddy et al., 1996; Reicks et al., 1997; Zanoli, 1998; Zotos et al., 1999; Worner and Meier-Ploeger, 1999; Chryssohoides, 2000; Browne et al., 2000; Fotopoulos and Krystallis, 2002; Markovina et al., 2011, Rehber, 2011). Çelik (2013) explains that consumers perceive organic products tastes as nostalgic because they remind them the taste of food in older times in Turkey. Hamzaoui- Essoussi and Zahaf (2012) add that taste is an important determinant for organic food choice as it is an egocentric preference. Oraman (2014) also highlights the taste as one of the important motives to buy organic food in Turkey. On the other hand; there are also studies claiming that the taste does not differ between organic and conventionally grown products for consumers (Jolly & Dhesi, 1989; Jolly & Norris, 1991; Sparling et al., 1992)[2].

Appearance is an important factor that determines purchasing decision. Ott (1990) shows that people care about the appearance of organic food products and are unwilling to buy as they appear to be defected products. Zanoli and Naspetti (2002) argue that consumers tend to give importance to the taste and appearance of organic food products, they find them tasty but the appearance can be deterrent. On the other hand, Goldman and Clancy (1991) show that organic produce consumers are more tolerant than non-organic produce consumers about defects on organic food products. Harris et al. (2000) claim that consumers' decision-making processes are mostly affected by their visual estimation, but the negative effect of defects on organic produce is hard to guess. Also, other studies argue that the negative effect of

[2] See Sparling et al. (1992), Harris et al. (2000), Davies et al. (1995) for detailed information on the effects of sensory variables.

appearance is not clear (Sparling et al., 1992; Tregear et al., 1994). Fotopoulos and Krystallis (2002) found in their studies that poor appearance is not an important trigger to prevent consumer from buying organic. Moreover, it is possible to argue that consumers with higher education or with higher income tend to worry less about the defects on organic products (Ott 1990; Tsakiridou et al., 2008).

Freshness is among satisfactory specifications of organic food products with taste, nutritional value, quality, visual appeal (Paul and Rana, 2012). Davies et al. (1995) claim taste as a specific product attribute. Fresh organic food like fruits and vegetable accounts for almost 20% of many national organic markets in EU as FIBL and IFOAM (2016) state. From another perspective, freshness is ranked as the least or less important factor according to Wier et al. (2008). Sparling et al. (1992) argue that according to consumers, there is no difference in terms of freshness between organic and conventionally grown food product.

Shelf life is linked to freshness as it refers to the storage time of organic produce (Harris et al., 2000). Magnusson (2004) explains that consumers do not think that organic food products have superiority in terms of shelf life.

2.2.2.3.Perception variables

Information about organic production, price premiums, environmental and health benefits influences purchasing decision in a positive way and the lack of information is a barrier for the demand for organic food (Padel and Foster, 2005; Underhill and Figueroa, 1996; Makatouni, 2002; McEachern and McClean, 2002). The organic knowledge is linked with socio-demographic specifications, lifestyles, information provided by public administrative units, shopping sites, ecological NPOs, mass media (Gracia and de Magitris, 2007)[3].

[3] See Tsakiridou et al. (2008) for detailed information on the relationship between education and knowledge on organic food market.

Organic labeling can be considered as a way to inform consumers that the product meets the organic standards (Torjusen et al., 2004; Zanoli and Naspetti, 2002) whereas Vindigni et al. (2002) propose that organic label indicates a claim that the process with which the labeled product is produced meets certain healthy agricultural practices and consumers perceive organic labels as a guarantee for environment-friendliness, quality and safety[4].Teisl and Roe (1998) define product labelling as a policy instrument given by a government, or a third party showing the quality, taste, nutrition values, content and information about the product in terms of environmental impact, production process. Rodriguez et al. (2008) suggest that the lack of national organic label limits organic food consumption in Argentina. Yiridoe et al. (2005) found labels as "quality signals". Furthermore, the logo and labelling is a simpler way to guarantee the high standards of organic production (European Court of Auditors, 2018). Wier et al. (2008) show that most of Danish consumers trust the government organic label, whilst Hamm et al. (2002) express that in UK, there are 5 different inspection bodies with their own labels and the logo of Soil Association is the most well-known and spread. Wier et al. (2008) also explain that having many labels and logos about organic does not cause a problem in UK (referring to British House of Commons report in 2001)[5]. On the other hand, Lea and Worsley (2005) find that half of the consumers in their survey sample do not trust organic labels in Australia.

Certification is the most important process in organic production as it guarantees specific rules. Krystallis and Chryssohoidis (2005) state that the increasing demand for organic food leads to developments in the organic certification process. Besides, Yin et al. (2010) argue that labelling of certification body enables the confirmation of the authenticity of organic ingredients, however in their study in China, only almost 1/3 of consumers recognize it. Also, Krystallis and Chryssohoidis (2005) argue that the confidence on certification affects the willingness to pay for organic food products. Aertsens et al. (2009) discuss the uncertainty about certification as a barrier for the growth of the organic food demand. Similarly, Yiridoe et al. (2005) suggest that

[4] Hamzaoui-Essousi and Zahaf (2008b) show similarly that organic labeling is interrelated with the confidence of consumers on organic food.

[5] Source: Ministry of Agriculture, Fisheries and Food, UK, "House of Commons - Agriculture - Fifth Special Report", London, UK: Parliament, 2001.

consumers are skeptic about organic certification process due to the lack of uniform standards and this situation may cause a hesitation in the organic food purchase.

The availability of organic products is analyzed in several studies and it is argued that organic food products have lesser availability than conventional products in general (Jolly, 1991; Tregear et al., 1994; Roddy et al., 1996; Wandel and Bugge, 1997). Also; it is shown that the lack of availability can be an important barrier for the growth of the organic food demand (Lea and Worsley, 2005; Aertsens et al., 2010; Uma and Selvam, 2016).

2.2.3. Determinants of Organic Food Demand

2.2.3.1.Income

Income affects the purchasing decision, as it is generally believed that organic food prices are higher than conventional food prices; thus lower income can be seen as a reason for low demand. Lockie et al. (2002) show that one of the main determinants of organic consumption is its price. In the literature, income has shown to have a significant role in the demand for organic food (Fotoupoulos and Krystallis, 2002). Aertens et al. (2009) explain that in Europe, Canada and Australia income is positively correlated with organic demand, however in US, it does not have a significant role. On the other hand, Dettmann and Dimitri (2010) suggest that income has a significant importance and a positive correlation with the organic vegetable demand in US. In Canada, Hay (1989) and Cunningham (2002) state that there is a positive relationship between income and willingness to purchase organic produce. In China, Xie et al. (2015) found a positive but insignificant correlation between family income and organic food purchase. Harris et al. (2000), on the other hand, claim that income is not a specific determinant for the organic demand. In Turkey, Oraman (2014) has found that organic produce consumers have above average income

2.2.3.2.Price Premium

Price premium i.e. price difference between organic and conventional food products is mostly seen as a crucial problem in the growth of the demand for organic food (Byrne et al., 1991; Tregear et al., 1994; Roddy et al., 1996; Magnusson et al., 2001; Zanoli and Naspetti, 2002; Hughner et al., 2007). Brown and Sperow (2005) express that price premium in organic food products exists due to the limited supply. Padel and Foster (2005) state that if consumers are aware of the reasons why organic food products are more expensive than their conventional counterparts, they could accept high price premiums. From another point of view, Hill and Lynchehaun (2002) express in their study that high price of organic milk might be a signal for better quality and consumers may be willing to pay a higher price. It is also possible to argue that the price premiums between organic food products and their conventional counterparts differ in accordance with the product type and seasonality.

2.2.3.3.Willingness to pay

The willingness to pay (WTP) is defined as the maximum price a given consumer accepts to pay for a product or service. Barnes et al. (2009) explain that a better organic knowledge leads to higher willingness to pay. Krystallis and Chryssochoidis (2005) report that Greek consumers have a higher willingness to pay for organic vegetables and fresh products. Armağan and Özdoğan (2005) found that consumers are willing to pay more 30% for ecologically produced eggs in Turkey. Fotopoulos and Krystallis (2002) indicate that higher income do not affect WTP, it only affects the quantity of organic product bought.

2.3. DATA ANALYSIS AND ECONOMETRIC MODELS

In view of the studies in the literature, in order to describe the profile of Turkish organic food consumers, we have focused on the following aspects of consumers' knowledge, attitudes and purchase behavior: ***their consideration in choosing food*** (vitamin, protein, calorie, fat) ***and its dietary aspect*** (weight controlling, energising, nourishing, digesting and improving life quality), ***thoughts and beliefs about organic food products*** (reducing risk illness, being therapeutic, tasteful, nutritious, rich in variety, sold with affordable prices, having no difference with natural or conventional counterparts), ***environmental concerns*** (importance of environmental pollution, contribution to recycling and ecological selectiveness in food consumption, need of information on country of origin of products, whether they are produced in an environmentally friendly environment with proper packaging for recycling and without drugs) and ***environmental knowledge*** (knowledge on environmental issues like acid rains, water pollution, carbon emissions and greenhouse gas releases and world hunger) and ***health concerns*** (whether the consumer or his/her family members are diagnosed with these diseases like cancer, obesity, diabetes, hearth and vascular diseases, allergic diseases and Parkinson, whether they are smoking or not and their level of physical activity). Finally, we have tested their ***information on organic food certification*** using different logos including the official national organic logo, good agricultural practices logo and 3 other fake logos that we have created using organic, natural, GDO-free labels[1]. The participants were asked whether they recognize these and whether they are organic food logos. We are interested in their ***source of information*** on organic food (alternatives family-friends, TV-radio, social media, doctor recommendation, and other sources) and their ***confidence on food advertisements***.

[1] See Appendix B for logos listed in the consumer survey.

Table 2.1 Socio-demographic Characteristics of the Sample

Socio-demographic characteristics	**Share within the sample (%)**	**Socio-demographic characteristics**	**Share within the sample (%)**
City		**Age**	
Istanbul	57.7	20-29 years	29.36
Ankara	26.31	30-44 years	50.15
Izmir	15.99	45 years and older	20.49
Gender		**Education**	
Male	51.31	Primary and Middle School Graduates	33.28
Female	48.69		
		High School Graduates	42.15
		College and Master/PhD Graduates	24.56
Employment Status		**Household size**	
Unemployed	1.74	1 person	6.83
Student	7.7	2 people	24.27
Housewife	15.7	3 people	31.98
Retired	3.63	4 people	27.47
Self-employed	10.61	5 people and more	9.45
Private sector employee	47.82		
Public officer	12.79		
Marital Status		**Presence of Children**	
Married	61.77	Yes	30.67
Single and Divorced	38.23	No	69.33

2.3.1. Research Design, Data and Econometric Models

We have conducted a consumer survey of 43 questions to 750 participants in the three largest metropolitan cities in Turkey; Istanbul, Ankara and Izmir[1]. A variety of studies display different profiles of consumers and their consumption behaviour considering their organic food purchases. The determination of the characteristics of organic food consumers can be counted as the first pillar to describe the demand for organic food. The sample was selected using a stratified random sample of consumers by quotas based on age, gender and city populations determined by TURKSTAT (TURKSTAT, 2016a, 2016b). Table 2.1 shows socio-demographic characteristics of the sample.

To analyze the factors affecting the intention to purchase organic foods, an econometric model has been used. 70% of the participants (522 participants) do not consume organic food and 30% participants consume organic food products with a total of 228 participants. We have constructed a Logit regression model in order to estimate the likelihood of being an organic food consumer depending on the conditional set of independent variables we have obtained using the questionnaire[2] by controlling the socio-demographic aspects (city, gender, age, education, monthly household income, marital status and the presence of children in the household, number of household members and education (high school graduates and college/Master od PhD graduates). The results of the econometric model are represented in Table 2.2. A detailed explanation of methodology that is used is explained in Appendix A. The dependent variable (***organic***) takes on the value 1 if the participant states that he/she consumes organic food products and 0 if the participant states the opposite. We have ended up with the following results that are presented with the corresponding hypothesis.

[1] See Appendix B for survey questions.
[2] Participants aged 15 to 19 years were excluded from the econometric model, as they do not make any food purchase decisions in the household. In the econometric model, employment statuses are excluded, we have added housewife, retired and private sector employee statuses to avoid any correlation with other socio-demographical variables. Also education levels are put in the econometric model as dummy variables for high school and college-Master/PhD graduates.

2.3.1.1.The Likelihood of Being an Organic Food Consumer

Socio-demographical factors: Consumers living in Ankara are significantly less likely to be organic food consumers than consumers living in Istanbul and Izmir. Our results show that age is strongly and positively associated with the consumption of organic food similar to findings in Mintel (2000) and Geen and Firth (2006). We see that older people are more likely to be organic food consumers i.e. consumers belonging to the oldest group are 6.15 times more likely to be organic food consumers. Gender is not a significant indicator of organic food consumption. However, marital status is; married people are more likely to consume organic food. Having children has a significant negative effect on the likelihood of organic consumption. Similar to Tsakiridou et al. (2008), we found that household size is insignificant to define the organic food demand. We have used employment statuses such as being a housewife, retiree and private sector employee: being a housewife has a positive but insignificant impact, being a retiree has a negative and insignificant impact whereas, a private sector employee is significantly less likely to consume organic food. Our results on employment statuses do not match the results of previous studies in Turkey[3]. The reason might be the greater share of private sector employees in our sample. Regarding education levels, being a high school graduate has a positive but insignificant effect whereas being a college or Master/PhD graduate has a negative and insignificant effect on the organic food demand. The existing literature has varying results regarding the impact of the level of education on organic food consumption; our result is consistent with Arbindra et al. (2005).

Hypothesis 1 *Turkish organic food consumers have higher income.*

We see from Table 2.2 that monthly household income has a highly significant and positive impact on organic food consumption. Having a higher income increases the likelihood of being an organic food consumer. In addition to this, participants believing that organic food products have affordable prices are significantly more

[3] Tetik (2012) stated that private sector employees are potential organic consumers.

likely to consume organic food. This result is in line with Fotoupoulos and Krystallis (2002), Oraman (2014) and Tetik (2012). Thus we accept the hypothesis 1.

Table 2.2 The Likelihood of Being an Organic Food Consumer[4]

Control variables		Factors affecting the purchase of food	
CITY.2	-1.880*** (0.722)	VITAMIN	0.361 (0.248)
CITY.3	-0.170 (0.630)	PROTEIN	0.370 (0.284)
GENDER.1	-0.476 (0.342)	NOURISHING	-1.044*** (0.231)
AGE.2	0.968** (0.396)	LOWCALORIES	-0.272 (0.209)
AGE.3	1.816*** (0.571)	WEIGHTCONTROL	0.115 (0.210)
MARITALSTATUS.2	-1.280** (0.509)	LOWFAT	-0.147 (0.194)
HOUSEHOLDSIZE	0.126 (0.169)	DIGESTIVE	0.0610 (0.216)
CHILDREN.1	-0.873* (0.508)	ENERGETIC	-0.311 (0.202)
RFP.2	0.199 (0.447)	LIFEQUALITY	0.290 (0.209)
RFP.3	3.319*** (1.206)		
HOUSEWIFE	0.407 (0.696)	**Variables on thoughts and beliefs about organic food**	
RETIRED	-1.039 (1.046)	THERAPEUTIC	-0.211 (0.255)
PRIVSECT	-1.056*** (0.383)	TASTEFUL	0.364* (0.204)
HIGHSCHOOLGRAD	0.159 (0.381)	NUTRITIOUS	-0.379* (0.222)
COLLEGEGRAD	-0.459	IMPROVEQUALITY	-0.103

[4] Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

	(0.469)		(0.203)
MONTHLYINCOME	0.895*** (0.205)	AFFORDABLEPRICE	0.386** (0.165)
Constant	-5.991*** (1.884)	NODIFFERENCECONV	0.127 (0.146)
		BRAND	-0.171 (0.171)
Environmental knowledge and concern variables		NOCONTAINOFDRUG	-0.100 (0.185)
PRODUCTIONCOUNTRY	0.448* (0.232)	VARIETY	0.0885 (0.178)
ENVFRIENDLINESS	0.153 (0.279)	NODIFFERENCENATURAL	-0.0176 (0.184)
RECYCLEDPACK	-0.545** (0.224)	REDUCERISKILLNESS	0.836*** (0.259)
NOCHEMICALS	-0.244 (0.220)		
KNOWACIDRAIN	0.0904 (0.187)	**Variables on source of information**	
KNOWWATERPOLL	-0.301 (0.201)	FAMILYFRIENDS	0.0273 (0.417)
KNOWCARBONEMISSION	0.0575 (0.162)	TVRADIO	0.313 (0.396)
KNOWWORLDHUNGER	-0.208 (0.209)	SOCIALMEDIA	0.861** (0.411)
IMPPOLLUTION	0.454** (0.189)	DOCTORREC	0.734* (0.376)
CONTRIBUTIONRECYCLING	0.314 (0.196)	OTHERSOURCES	0.775 (0.872)
ECOSELECTIVENESS	0.551*** (0.192)	ADVTVRADIO	-0.410* (0.233)
		ADVBILLBOARD	-0.0619

			(0.222)
		ADVSOCIALMEDIA	-0.146 (0.185)
		ADVANNOUNCEMENTS	0.223 (0.222)
		CONFIDENCEADV.2	-0.389 (0.422)
		CONFIDENCEADV.3	-1.046** (0.526)
Health concern variables		**Variables on information on organic certification**	
SPORT	0.383** (0.183)	LOGO1	0.250 (0.446)
SMOKE	0.329 (0.348)	LOGO2	-0.113 (0.425)
OWNCANCER	0.277 (1.000)	LOGO3	-0.0404 (0.379)
OWNOBESITY	-0.387 (0.966)	LOGO4	0.727 (0.454)
OWNDIABETES	1.270 (0.917)	LOGO5	0.336 (0.407)
OWNHEARTDIS	1.001* (0.576)	LOGOORG1.2	-1.223*** (0.444)
OWNALLERGIES	-0.656 (0.647)	LOGOORG1.3	-0.460 (0.745)
OWNPARKINSON	2.748** (1.215)	LOGOORG2.2	0.518 (0.411)
FAMCANCER	-0.221 (0.556)	LOGOORG2.3	-1.197 (0.842)
FAMOBESITY	-2.398*** (0.885)	LOGOORG3.2	-0.125 (0.393)
FAMDIABETES	0.265 (0.495)	LOGOORG3.3	0.464 (0.726)

FAMHEARTDIS	0.369 (0.407)	LOGOORG4.2	0.337 (0.440)
FAMALLERGIES	-0.863 (0.549)	LOGOORG4.3	0.225 (0.755)
FAMPARKINSON	-2.156** (0.858)	LOGOORG5.2	-0.571 (0.420)
		LOGOORG5.3	0.583 (0.875)
R^2	0.5080	Observations	578

Hypothesis 2 *Turkish organic food consumers are more health conscious.*

Doing physical activities and not smoking are nowadays widely accepted signs of health consciousness. We see from the results that physical activities have a highly significant positive impact on the likelihood of organic food consumption. Smoking, on the other hand, does not affect the likelihood significantly. According to TURKSTAT (2012), the average percentage of smoking among adults is around 30% whereas in our sample it is 46%. We can say that the sample may be biased in terms of smoking. These results suggest a link with health consciousness and organic food consumption. The results indicate that having heart and cardio vascular diseases and Parkinson have a strong significant impact whereas having cancer and diabetes have positive but insignificant impact and having obesity and allergies have negative but insignificant impact on the likelihood of organic food consumption. Note that a participant diagnosed with heart and cardiovascular disease is 2.72 times more likely to be an organic consumer. When we looked into the correlation between having Parkinson disease and consuming organic food, it is seen that a participant who is diagnosed with a Parkinson disease is 15.6 time more likely to be an organic food consumer. We have investigated the family health background as well. Having family member(s) with obesity and Parkinson diseases have a negative and significant impact on organic food consumption while having family members diagnosed with cancer and allergies have negative but insignificant impact and having family member(s) with diabetes and heart and cardio-vascular diseases have positive but insignificant impact

on organic food consumption. Regarding the sign of obesity, we can say that healthy eating habits are inherited as the difference at the sign of having family members with obesity and having obesity suggests. Doctor recommendation has also a positive impact at the significance level of 1%. Participants believing that consuming organic food reduces the risk of illness are significantly more likely to consume organic food but this is not true for the belief of the therapeutic impact of organic food, which is insignificant and positive. We can see that most variables related to health consciousness affect the organic food consumption in a positive way. Similar to Magnusson et al. (2003), Stobbelaar et al. (2007) and Lea and Worsley (2005), we can argue that organic consumption in Turkey is related with health consciousness.

Hypothesis 3 *Turkish organic food consumers find organic food more nutritious.*

Believing that organic foods are nutritious has negative and significant impact on organic food consumption; looking for nourishing content in the purchase of food has also a negative and significant relationship with organic food consumption. Thus, we will reject Hypothesis 3. Although people looking for low fat and low calorie content food are less likely to be organic food consumers, this relationship is insignificant. We see that the relationship in term of vitamin richness, protein richness, effectiveness in weight control, digesting and improving life quality is positive but still insignificant. These results suggest that we should also question the meaning that the participants attribute to the nourishing characteristics of food.

Hypothesis 4 *Turkish organic food consumers find organic food tasteful.*

Participants believing that “organic food products are tasteful” are significantly more likely to be organic food consumers. We see that a participant who finds organic food tasty is 1.44 time more likely to be an organic food consumer. We can say that one of the factors affecting the demand for organic food is the fact that organic food is found to be more tasteful, thus Hypothesis 4 is accepted.

Hypothesis 5 *Turkish organic food consumers are more environmentally aware.*

Environment awareness indicators such as the need to know the country of origin of the food consumed, to consume food respecting ecological selectiveness, believing that "environment pollution is important" are significantly and positively related to organic food consumption. A participant who cares about the origin of the food consumed and believes that "environmental pollution is important" is 1.57 times more likely to be an organic food consumer. In addition to these, a participant who consumes food respecting ecological selectiveness is 1.73 times more likely to consume organic food products. On the other hand, preferring food products to be properly packaged for recycle has a negative and significant relationship with organic food consumption at the level of 5% and contributing to recycling has a positive and insignificant impact. We see that organic food consumption increases with the aspect of environmental awareness related to agricultural production practices. Recycling as an aspect of environmental awareness is more widespread and is not found to be a distinctive feature of organic food consumers. We observe that the knowledge on environmental issues like acid rains, carbon emissions and greenhouse gas releases affects positively but insignificantly the likelihood of organic food consumption whereas the knowledge on water pollution and world hunger have negative and insignificant impact. The knowledge about environmental issues is not a distinctive feature of organic food demand. We have, on the hand, reason to believe that having concern on agricultural practices is a distinctive characteristic of organic food consumers.

Hypothesis 6 *Turkish organic food consumers have more information on organic food.*

We have tested the knowledge of participants on organic food through their identification of organic logos and certifications. We have presented the participants with five logos[5]: i. the first logo is made by Ministry of Agriculture and Forestry, Turkey and it represents the guarantee of organic authenticity of the food product as all certified products are obliged have this logo. ii. we have designed the second, fourth and fifth logos as example brand logos and they do not represent or guarantee any

[5] For detailed information on logos that are shown to the participants, see Appendix B

organic authenticity, any certification body or governmental bodies' inspection or organic standards. iii. the third logo officially represents "the good agricultural practices in Turkey". First question is related to their recognition of these logos. Surprisingly, all of these logos have similar recognition levels. We see that a participant recognizing the first logo is 2.07 time more likely to be an organic food consumer. We expect that the recognition of the first logo is a characteristic of organic consumers however; we have found that although the sign is positive, the coefficient is insignificant. Apart from the coefficients for the second and third logos, all coefficients are positive but insignificant. Then we have tested whether participants can distinguish organic logos and certifications[6]. Regarding the first official organic logo, we find that people thinking that the logo does not represent organic food products are significantly less likely to be organic consumers and people having no information are less likely to be organic consumers but the sign is insignificant. Since the first logo represents organic authenticity, we can argue that organic food consumers are more likely to differentiate this logo. There is no significant and meaningful relationship for the other logos. This result shows that Turkish consumers are not properly informed about organic certifications and signals. Unfortunately, although there exists a demand for organic food (participants claimed that they buy organic food), this demand is not well-informed, disoriented and bound to moral hazards existing in the current market. Nevertheless, we can say that organic food consumers are more likely to differentiate the official logo.

These questions aimed also to answer whether Turkish consumers differentiate the logos with names similar to organic such as "natural, "GMO-free" in the fifth logo based on Yiridoe et al. (2005) arguing that consumers tend to be confused with the labels showing healthy meanings. Even though participants claiming that the fifth logo represents organic food products are less likely to be organic consumers, the result is insignificant. In addition, we wanted to test this confusion verbally with two questions regarding their thoughts and beliefs: i. "there is no difference between organic food

[6] The variable LOGOORG is a categorical variable as we cannot order values for LOGOORG which takes values of 1 if Logo represents organic food products, 2 if Logo does not represent organic food products and 3 if the respondent has no information whether Logo represents organic food products or not i.e. LOGOORG12 takes the value 1 if the respondent thinks that this logo does not represent organic food products and 0 otherwise and LOGOORG13 takes the value 1 if the respondent has no information whether this logo represents organic food products or not and 0 otherwise.

products and natural labeled food products" and "there is no difference between organic food products and their conventional counterparts". Their coefficients are insignificant despite the difference of sign. The fact that a consumer thinks that these other alternatives represent other different categories does not increase its likelihood of being an organic consumer[7].

Regarding the sources of information about organic products, we see that participants stating that they have heard the term "organic" from social media and through doctor recommendation are significantly more likely to be organic food consumers. Also, participants who have heard "organic from social media, doctor recommendations are more than 2 times more likely to be organic food consumers. However, the coefficients for sources like family and friends, TV and radio and others are positive but insignificant. As a source of gathering information on food in general, tracking food advertisements is also tested. Participants tracking food advertisements from TV and radio are significantly less likely to be organic food consumers. The reason behind this may be the lack of organic food advertisements on TV and radio or the relatively higher frequency of advertisements for conventional food. Tracking food advertisements from both billboards, leaflets and social media have negative and insignificant impacts. Following the announcements at shopping places increases the likelihood of being an organic consumer but this result is insignificant.

We have tested for the opinions of participants regarding the food advertisements[8]. We see that the participants believing that "food advertisements are exaggerated" are less likely than participants trusting food advertisements to be organic consumers but this result is insignificant whereas the participants not trusting

---

[7] The Turkish government protects consumers against moral hazards arising from this confusion in the fifth section of the regulation on the principles and practices of organic farming; the production, packaging, labelling, storage, transportation and marketing of organic products by forbidding the use of bio and eco as a prefix or suffix and natural in the labelling of products other than organic products. The term natural is only reserved for olive oil even if it is not organic as the production method has been described as such for years.

[8] The variable CONFIDENCEADV is a categorical variable as we cannot order values for this variable which takes values of 1 if the participant trusts food advertisements, 2 if the participant thinks that food advertisements are exaggerated and 3 if the participant does not trust on food advertisements i.e. CONFIDENCEADV.2 takes the value 1 if the respondent thinks that food advertisements are exaggerated and 0 otherwise and CONFIDENCEADV.3 takes the value 1 if the respondent does not trust on food advertisements and 0 otherwise.

food advertisements are less likely than participants trusting food advertisements to be organic consumers with the result being significant. We can say that organic agriculture being part of an industrial production and distribution system includes an original belief in the industrial production and distribution systems. The whole confusion leading consumers to value more natural goods than organic ones arises mostly from the same disbelief.

2.3.1.2.The Demand for Organic Food

In the previous section, we have tried to figure out the distinctive characteristics of Turkish organic consumers. Now, we will study the demand for organic food. To do so, we have specifically asked questions to participants stating that they consume organic food (228 out of 750 participants). The questions now address the types of food that those consumers choose to purchase, their motivations in their purchase of organic food, their shopping environments in addition to previous questions. In addition, participants were asked a question regarding their willingness to pay for organic food products, more specifically how much more they would be willing to pay over the price of the conventional alternative[9]. We provide the list of questions along with the variables attributed to these questions in Appendix B.

At this point, our aim has been to construct a reservation price index for organic food. We have taken the sales ratios of conventional food products from TURKSTAT (2003) and multiplied the share of the sales of each food category by the mean of the interval that the participants have declared in the willingness to pay question. So, if they were to make all their shopping based on the shares in this basket, they would be willing to pay the result that we have obtained by this calculation plus 100. Thus, this calculation will give an approximate measure of a reservation price for organic food basket, that we will denote as WTP (willingness to pay). Figure 2.1 gives the results divided by 100 and sorted in a descending fashion. In this graph, there are two main jumps: one at 1.58 and the other at 2.38. These are pointes where we see higher

[9] They were asked to choose from 9 intervals: 0-20%, 20-40%, 40-60%, 60-80%, 80-100%, 100-200%, 200-300%, 300-400%, 400% and more. So for example, if the participant chooses 20-40% interval, this means that he/she is willing to pay 20-40% more for the organic counterpart.

changes in the data. They are visible on the graph more like kinks. We can see that organic consumers are not homogeneous but they can be differentiated in terms of their reservation prices. A high reservation price group (WTP>2.46) and a low reservation price group (WTP<1.58).

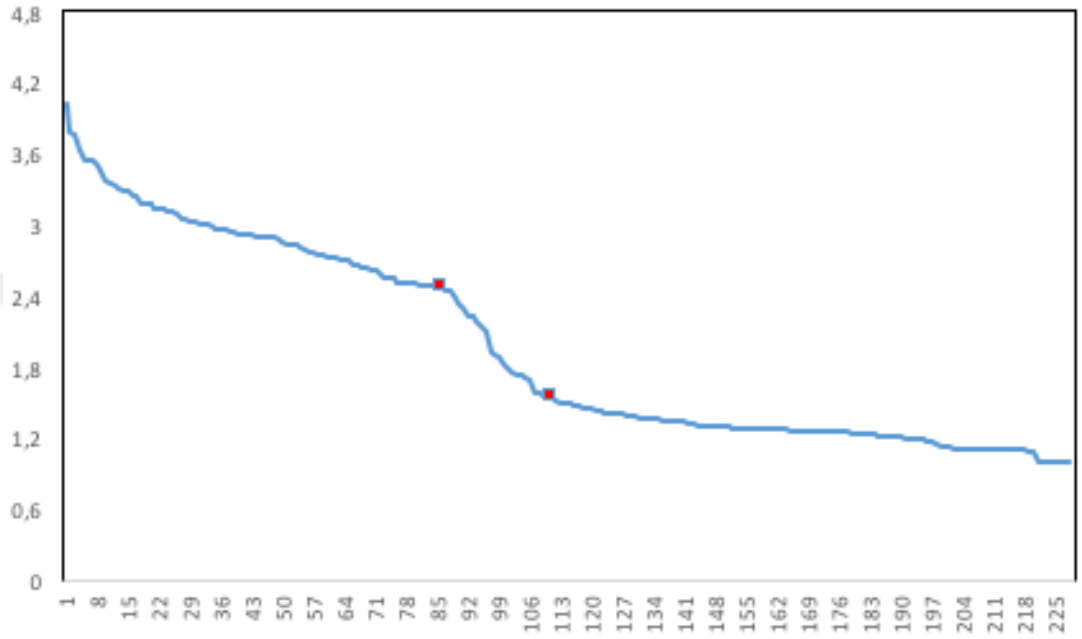

Figure 2.1 General willingness to pay for organic food (relative to conventional food)

We have conducted our econometric model to these different segments in the market to see how they are differentiated. The dependent variable is the reservation price of organic consuming participants (WTP) and we try to explain the change in this variable using the variables we have derived from the second part of the survey using OLS estimation (results are provided in Table 2.3). There are two columns for the estimation results; the first is for the low reservation price segment (WTP<1.58) and the second is for the high reservation segment (WTP>2.46)[10].

[10] To detect and prevent multicollinearity, we have applied VIF analysis. See Appendix A for more detailed information on logistic regression and VIF analysis. In this manner, we have eliminated health concern motivation, organic spice consumption and short-term storage of organic food products in our first model. In the second model, we excluded supermarket, food safety concern motivation, consuming organic fresh fruits and vegetables, legumes, eggs, baby food, drinks, oil, sugary food and spice; believing that organic food products are nutritious, they have affordable prices and therapeutic property. Note that in the first group, the impact of income is negative although it is insignificant. The categorical

For the first group with lower reservation prices, we see that the reservation price is affected with motivations of freshness, nutrition, food safety, environmental concerns, support of local organic farming, sustainability and benevolence. For this group, we can say that organic food is a substitute for conventional food, with benefits (environment and sustainability), if they are more likely to buy organic food for nutrition, freshness and food safety (for the core product values) they are willing to accept lower prices than other organic consumers in this group (negative signs for the coefficients of these motivations) and are willing to pay more if they are motivated more by the added value such as environmental protection, sustainability and benevolence (positive signs for the coefficients of these motivations). We see that the coefficient of the motivation of supporting local agriculture is negative; this can be explained by the expectation of lower domestic product prices. The movements in the reservation prices for these consumers are motivated with the value added of the organic food. In terms of shopping environment, if they prefer more discount markets and farms, they have lower reservation prices. This result is in line with the prices prevailing in those environments. We see that participants consuming organic bakery products have higher reservation prices in this group. In Turkey, organic bakery is a new addition to the organic food basket. We can guess that participants consuming organic bakery are either buying everything included this or only this product group. In the first case, organic consumption must have replaced most of the conventional food consumption and consequently they value organic food more. In the second case, this good must be a new alternative, differentiated with other values thus they will be willing to pay more. For this group, organic food is just like conventional good a ***necessity*** with value added. This conclusion is also motivated by the fact that consumers seeing lack of food variety as a barrier have higher reservation prices.

For the second group of consumers with higher reservation prices for organic food, organic food is more like a ***variety*** in the food basket since brand selection is an important aspect of their conception of organic food and the significant barriers they see in the organic food market are the lack of brand variety and cooking and storage disadvantages. If they are motivated to support local food alternatives in their purchase

---

variable serves to reduce the nonlinearities in the group due to income differences, as income difference would entail shopping environment and pricing differences.

of organic food, they tend to value organic food less just like the other segment. We see that the same attitude for diversity exists in terms of shopping environment, if they prefer more online shopping, a newer shopping alternative, they have higher reservation prices.

Table 2.3 Consumer Profile for Different Reservation Values[11]

Control variables			**Variables on organic food shopping environment**		
CITY.2	-0.0293 (0.0802)		SUPERMARKET	-0.0722 (0.0520)	
CITY.3	0.196** (0.0768)		DISCOUNT	-0.146** (0.0666)	-0.308 (0.266)
GENDER.1	-0.0604* (0.0351)	0.232 (0.177)	OPENBAZAAR	-0.0488 (0.0513)	-0.281 (0.274)
AGE.2	0.00256 (0.0490)	-0.139 (0.137)	ORGSHOP	-0.0378 (0.0469)	0.148 (0.143)
AGE.3	0.0477 (0.0508)	-0.418** (0.200)	ORGBAZAAR	0.0628 (0.0468)	-0.0489 (0.215)
EDUCATION	0.00613 (0.0341)	-0.164 (0.121)	SPECIALTYSHOP	-0.0149 (0.0358)	0.271 (0.167)
MARITALSTATUS.2	0.0929* (0.0500)	-0.0522 (0.256)	FARM	-0.120** (0.0503)	-0.194 (0.222)
HOUSEHOLDSIZE	-0.0133 (0.0167)	0.162* (0.0856)	ONLINE	0.0697 (0.154)	0.744* (0.398)
CHILDREN.1	-0.000151 (0.0521)	-0.0435 (0.265)	**Variables on motivations for organic food consumption**		
MONTHLYINCOME.2	-0.0813 (0.0915)	0.131 (0.194)	MOTHEALTH		-0.200 (0.137)
MONTHLYINCOME.3	-0.124 (0.102)	0.225 (0.344)	MOTFOODSAFETY	-0.155*** (0.0474)	
MONTHLYINCOME.4	-0.0419 (0.0964)		MOTANIMALWELFARE	0.0589 (0.0355)	-0.240*** (0.0794)
MONTHLYINCOME. 5	-0.132 (0.104)		MOTLESSPOLL	0.104*** (0.0366)	0.0657 (0.0834)
MONTHLYINCOME.6	-0.115 (0.148)		MOTTASTE	0.0161 (0.0391)	-0.0845 (0.0885)
MONTHLYINCOME.7	0.124		MOTFRESHNESS	-0.0679*	0.0858

[11] Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

	(0.157)			(0.0388)	(0.0895)
Variables on organic food consumption			MOTNUTRITION	-0.108*** (0.0363)	0.127 (0.0860)
ORGFRESH	0.0324 (0.0306)		MOTSUPPORTLOCAL	-0.0875** (0.0361)	-0.151* (0.0765)
ORGMEAT	0.0255 (0.0300)	-0.112 (0.120)	MOTSUSTAINABILITY	0.0791** (0.0374)	-0.0179 (0.0757)
ORGMILK	-0.0363 (0.0319)	0.0504 (0.0892)	MOTBENEVOLENCE	0.0748* (0.0413)	0.0644 (0.0843)
ORGCEREAL	-0.0527 (0.0349)	-0.107 (0.131)	MOTDOCTOR	0.0346 (0.0417)	0.194* (0.104)
ORGBAKERY	0.0425* (0.0242)	-0.141 (0.0951)	MOTPOPULARITY	0.0301 (0.0374)	0.0300 (0.0661)
ORGLEGUMES	-0.0282 (0.0335)				
ORGEGG	0.0353 (0.0285)		**Variables on thoughts and beliefs about organic food**		
ORGBABYFOOD	-0.00943 (0.0250)		TASTEFUL	-0.0570 (0.0420)	-0.0606 (0.0817)
ORGDRIED	0.00995 (0.0309)	0.0962 (0.112)	NUTRITIOUS	0.0265 (0.0453)	
ORGDRINKS	0.0582 (0.0383)		AFFORDABLEPRICE	-0.0179 (0.0187)	
ORGOIL	0.00726 (0.0266)		NODIFFERENCECONV	0.0218 (0.0177)	0.0357 (0.0705)
ORGSUGARY	0.00975 (0.0239)		BRAND	0.0185 (0.0251)	0.168** (0.0709)
ORGSWEET	-0.00409 (0.0246)	-0.0842 (0.0911)	VARIETY	0.0607** (0.0252)	-0.0672 (0.0867)
ORGOLIVE	-0.0134 (0.0294)	0.0173 (0.0785)	NOTCONTAINDRUG	-0.0268 (0.0309)	-0.0703 (0.0673)
			NODIFFERENCENATURAL	0.0139	-0.0334

				(0.0222)	(0.0916)
Constant	1.271*** (0.311)	4.356*** (0.961)	REDUCERISKILLNESS	-0.0486 (0.0410)	0.0816 (0.142)
			THERAPEUTIC	0.0340 (0.0253)	
Variables on barriers to consuming organic food products			**Variables on signals while noticing organic food products**		
BARAPPEARANCE	- 0.0512* (0.0292)	0.0642 (0.136)	SIGNALMINLOGO	-0.0120 (0.0384)	0.0386 (0.0889)
BARTASTE	0.0115 (0.0447)	0.114 (0.0764)	SIGNALCERTLOGO	0.0632* (0.0309)	0.0129 (0.156)
BARAVAILABILITY	-0.0295 (0.0334)	-0.0990 (0.0959)	SIGNALBRAND	0.0429 (0.0311)	-0.180* (0.102)
BARVARIETY	0.00487 (0.0265)	0.292*** (0.0984)	SIGNALORGANICNAME	0.00808 (0.0282)	-0.157** (0.0652)
BARLONGCOOK	0.00223 (0.0370)	-0.146* (0.0745)	SIGNALINGREDIENT	-0.0623* (0.0339)	0.0961 (0.0755)
BARSHORTSTORAGE		-0.251* (0.144)	SIGNALAPPEARANCE	-0.0129 (0.0259)	-0.228** (0.106)
			SIGNALORGANICBOARD	-0.0148 (0.0335)	0.0203 (0.0876)
Variables on consumer trust			**Health Concern Variables**		
CERTCONFIDENCE.2	-0.0472 (0.0544)	-0.276 (0.231)	SPORT	0.0239 (0.0196)	-0.0971 (0.0948)
CERTCONFIDENCE.3	-0.0149 (0.0380)	-0.629* (0.311)	DOCTORREC	-0.0155 (0.0402)	-0.151 (0.147)
Observations	102	79	R^2	0.863	0.779

2.4. CONCLUSION

In this chapter, we have analyzed the profile of Turkish food consumers in three largest metropolitan areas Istanbul, Ankara and Izmir and tried to differentiate organic food consumers by their socio-demographic characteristics, their conceptions of the value of food and perception of organic food. We have used a binary logistic regression model to analyse the likelihood of being an organic food consumer. In general, we can say that organic food consumers in Turkish metropolitan areas are generally married, aged older than 30 years and are more likely to have higher income. We have not found a significant relationship with gender, household size, and education level. The orientation to organic food is related to health concerns in the sense that people doing regularly physical activities consume more organic food products. We have looked at the orientation towards organic consumption in terms of having certain diseases or having experienced these through a member in the family. In this context there is a line between these two experiences as only when participants had heart and cardio-vascular, Parkinson diseases, they tended to consume organic food products. The impact of diseases in the family, on the other hand, has a different aspect. From family, participants inherit dietary habits and participants with obesity in the family tend to consume less organic food, continuing the old eating patterns. Unlike Grubor and Djokic (2016), infirmity of a sick family member is not an explanatory determinant for organic food consumption in our study. Besides, Turkish organic food consumers have a strong belief that “organic food products reduce the risk of illness” rather than they are “therapeutic”. Nutrition is not a trigger in the consumption of organic food and participants finding organic food nutritious are less likely to be consuming these; the reason may be income effect as a strong income effect is detected. However, taste is definitely a trigger. The ecological aspect of organic food in the eyes of participants is limited to less pollution associated with it and the privilege to know the country of origin.

Having information on the state organic logo has a positive impact on organic food consumption, whereas organic food consumers in our sample are confused about other logos' recognitions and organic representations. They cannot correctly answer all the logo questions and have a tendency to consider logos with labels like "GMO-free" and "natural" as organic. There is a lack of perception of organic among organic food consumers. They have no clear information about organic authenticity; they also cannot clearly distinguish the organic authenticity from other types of food products marketed as "natural" and also conventional. A strong income and price effect also causes the growth of organic food demand. The strong competition coming from the side of natural products may be the cause of this misinformation.

Regarding the sources of information about organic products, we see that consumers who heard "organic" from social media and through doctor recommendation are significantly more likely to be organic food consumers. Doctor recommendation as an information source on organic is crucial, for this reason the referral of the doctor can be associated with a healthy diet and organic food consumption. Thus a doctor advice may be an important factor to increase organic food awareness and consumption. However, as income effect is strong, this policy may have side effects on poor population. As a source of gathering information on food in general, tracking food advertisements has a negative impact on the likelihood of being organic food consumers. The reason behind this may be the lack of organic food advertisements on TV and radio or the relatively higher frequency of advertisements for conventional food. Tracking food advertisements from both billboards, leaflets and social media have negative and insignificant impacts. Following the announcements at shopping places increases the likelihood of being an organic consumer but this result is insignificant.

Regarding the food advertisements, we see that the consumers believing that "food advertisements are exaggerated" are less likely than participants trusting food advertisements to be organic consumers but this result is insignificant whereas the participants not trusting food advertisements are less likely than participants trusting food advertisements to be organic consumers with the result being significant. We can say that organic agriculture being part of an industrial production and distribution

system includes an original belief in the industrial production and distribution systems. The whole confusion leading consumers to value more natural goods than organic ones arises mostly from the same disbelief.

We have applied OLS estimation regarding the reservation price index that we hace conducted in accordance with WTPs of organic food consumers in our sample. This separate analysis on participants claiming to be organic consumers show that the market of organic food is segmented with one segment seeing this food as a perfect substitute for conventional food with value added by the environmental and sustainability aspects and the other segment with less average income perceiving organic food as a tastier variety in the food market. Again the nutritional aspect is problematic since both segments with nutritional concerns value organic food less; this may stem from the fact a nutritional alternative should not be that expensive.

3. THE ORGANIC FOOD SUPPLY IN TURKEY

3.1.INTRODUCTION

Organic food is among the fastest growing segments in the food industry with double-digit growth rate whilst convention food sales have reached 2-3% of growth (Oberholtzer et al., 2005). Statistics show that there is a tremendous increase in agricultural lands converting to organic production and there is an increasing trend of converting to organic agriculture (FIBL and IFOAM, 2018). European Commission expresses that organic market in EU is no longer a niche market; it is becoming a more dynamic sector in EU agriculture (European Commission, 2018).

In Turkey, organic food production follows a similar increasing trend, with increasing production rate[1], it is ranked as the eighth country regarding the number of organic farmers in the world and the first in Europe (FIBL and IFOAM, 2018). As of 2017, the number of organic producers has reached 75,067 in Turkey. Turkish producers have adopted organic agricultural practices as of 1984 as contractual agriculture with foreign companies in Turkey. Turkey has its national legislation since 2004 and the data system (OTBIS) has been in use since 2005 for organic agriculture. As of 2017, Turkey has 543,033 ha of total organic production land. Turkey is ranked as the 17th country regarding organic lands in 2016 whilst the share of organic lands is only 1.4% of its total lands which is 1.2% worldwide and 6.7% in EU. Between 2015 and 2016, Turkey's organic lands have increased by 37,708 ha which account for a growth of %7.8; whereas the growth rate has declined to 3.6 % between 2016 and 2017. Between

[1] For more detailed information, see Chapter 1.

2007 and 2016, organic lands have reached 399,514 ha with a growth rate of 175.2% (FIBL and IFOAM, 2018).

Table 3.1 shows the organic product types and their production areas in Turkey in 2016. Turkey is among the major producers of organic cereal, grape and it is ranked as the fourth country with the largest production area for organic temperate fruit (FIBL and IFOAM, 2018). The organic product range has grown by 50% with a total of 214 product types from 2002 to 2016 (Ministry of Agriculture and Forestry, Turkey, 2018a).

There is an increasing demand for organic food products in Turkey, the organic packaged food sale in domestic market has multiplied 4 times between 2009 and 2014 and it has reached 61.4 Million USD in 2014 as USDA (2016c) clarifies. Turkey mostly exports to US, Germany and France, the total organic production for export is more than 1.6 Million tonnes with a total export revenue of 78 Million USD approximately and its export revenue has an increasing trend since 2011 as mentioned earlier in Chapter 1[1]. The total import of organic products to Turkey is more than 650,000 tones by 2016. Turkey mostly imports from Russia, Netherlands, Kirgizstan, Germany and the mostly imported organic food products are soybean for consumption, wheat, sunflower and its products, corn as Ministry of Agriculture and Forestry reports (2018a).

Table 3.1 Organic Production in Turkey, 2016[2]

Org. Product Type	Production Area (ha)
Berries, wild	300
Fruit, wild	2,550
Medicinal and aromatic plants	25
Nut, wild	41
No details	134,517

[1] For more detailed information, see Chapter 1.
[2] Source: FIBL and IFOAM, "The World of Organic Agriculture, Statistics and Emerging Trends, 2018", Germany: FIBLE AND IFOAM, 2018, p 85.

There are several governmental incentives for organic producers including area payments[3], interest rate cut, business credits, small and medium enterprise aids, broadcasting in national TV and radio agency, loans and R&D support programs. However, there are important constraints to accomplish the potential growth in the supply side due to producers' unawareness and resistance to organic agriculture, additional costs, risks and concerns about long-term profitability and durance of governmental incentives (Ersun and Arslan, 2011; Akgüngör et al., 2010, Rehber, 2011).

Entering the organic food sector and conversion to organic agriculture has several hindrances. In this chapter, we will first point out the constraints, entry barriers in organic food sector in Turkey. Then, we will highlight the profile of organic producers and question the barriers preventing a higher growth in organic food supply. In the second section, we will look into the existing literature review and theoretical approaches for organic food supply. In the third section, we present the producer survey that we have used to investigate the characteristics of organic producers and barriers that producers are facing in organic agriculture. We provide our survey results and the econometric model used to identify organic producers. In the fourth section, we will specifically distinguish organic producers according to their year of entrance in organic agriculture. In the last section, we present our concluding remarks.

[3] For more detailed information on area payments for organic agriculture support in Turkey, see Chapter 1.

3.2.LITERATURE REVIEW

The existing literature in the supply side of organic agriculture and food market mostly focuses on theory of externalities, entry barriers and constraints.

3.2.1. Theory of Externalities

The economic theory states that an externality occurs when an economic activity indirectly creates a benefit or cost to those that are indirectly related to that activity. Lin (1976) states that the notion of externalities has impacts on economic welfare. Due to prevent the effects of negative externalities, the "Polluter Pays Principle" is mostly recognized. OECD Statistics Directorate (2001) defines the principle "*the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution*". The principal was accepted by the OECD members in 1972 and OECD imposed to use in agriculture in 1989 (Rosso Grossman, 2007). Thus it has become an economic and legal principle accepted by European Single Act in 1987 (Official Journal of the European Communities, 1987), Rio Declaration in 1992 (United Nations Conference on Environment and Development, 1992) and some governments have put it into their legislations (Conway and Pretty, 1992; Rosso Grossman, 2007).

The theory of externalities is widely used to understand the economic impact of agriculture. Novikova (2014) expresses that agriculture has also negative externalities in the form of uncompensated damage to the third parties. There are various negative impacts on other economic activities at each stage of the food system, from the production of inputs for farming through processing, transport and retailing

to consumption[1] (Pretty et al, 2001); these externalities have been calculated by Pretty et al (2000) for two production scenarios (conventional and organic) and four transport scenarios (all locally-sourced food; national by road; national by rail and road; and global by ship and air). The negative side effects of Britain of an individual's weekly food basket rises the cost of the food basket by 3% from £16.94 to £17.46 if organic-locally sourced, and rises by 16.3% to £19.69 if conventional-global.

3.2.2. Constraints and Entry Barriers in the Organic Food Supply

There are entry barriers in terms of production, high costs of conversion and certification, labour, land, lack of demand, supports, regulatory problems, farmers' attitudes toward organic agriculture (Walz, 2004; Strochlic and Sierra, 2007; Demiryürek, 2011).

This chapter aims to differentiate organic food producers from conventional ones. The analysis will underline in this way the barriers of entry in organic production because organic producers have chosen to convert to organic agriculture instead of continuing to use the conventional techniques. The following list provides possible entry barriers:

3.2.2.1. Conversion Period Difficulties

Organic agriculture requires a soil analysis before the conversion from conventional agricultural practices. The Ministry of Agriculture and Forestry, Turkey (2018b) expresses the requirements for organic agriculture as follows: *i. a distance that is not affected by streams and waters containing pollutant wastes, from areas*

[1] The use of pesticides by contaminating water, air and threat the eco-system health; nitrate and phosphate from fertilizers, livestock wastes, and silage effluents contaminating water, and so contributing to algal blooms, deoxygenation, fish deaths and nuisance to leisure users; soil erosion disrupting water courses, and runoff from eroded land causing flooding and damage to housing and natural resources; harm to consumers exposed to harmful residues and micro-organisms in foods; contamination of the atmospheric environment by methane, nitrous oxide and ammonia derived from livestock, their manures, and fertilizers; decrease in farm numbers, land abandonment, unemployment and poverty in rural areas are listed by Pretty et al (2001) as negative externalities and supporting local economies, contributing to aesthetics of the land scape, biodiversity, water sources, production of raw materials may be its positive externalities.

where conventional production is made, from busy premises, from heavy industrial facilities, from mine operations, from urban wastes collectively, ii. the supervision of the control and certification bodies and under the contract, since every stage of the production is controlled and the final product is certified as a production.

The existing literature refers to the longitude and complexity of the conversion period due to monitoring and detecting the suitability of air, soil and water quality and the use of pesticide (Walz 2004; Darnhofer et al 2005; Dobbs 2006; Guthman 2004; Jackson 2006). In Turkey, the Ministry of Agriculture and Forestry determines the transition period in organic agriculture for annual plants as 2 years and for perennial plants as 3 years[2] compared with two years of conversion period in organic farming before a product can be marketed as organic in EU and at least three years of conversion period from the application for organic farming to the purchase of the organic products as "*certified*" in US and Canada. Padel and Lampkin (1994) imply in their EU-wide study that during the conversion period, producers must improve the soil fertility as artificial fertilizers cannot be applied; adjust the stocking rate to the natural carrying capacity of the farms to ensure that livestock production can take place with the optimum number of animals and in free-range environment; adopt the management system to organic standards where the limited inputs are employed. In addition, several studies discuss the lower yield rates during the conversion period and the first years of conversion, low production levels due to inability to use of weeds and pesticides, higher costs associated with the use of compost, income losses due to not obtaining price premium in conversion periods, limited R&D opportunities and need of technical support to solve weed problems, to maintain soil fertility and yield variability (Fariweather, 1999; de Buck et al., 2001; Padel, 2001; Schneeberger et al. 2002; Walz, 2004; Demiryürek 2011).

[2] However; in special cases, Proposal of the Controlling Organization and the Organic Agriculture Committee Decision can reduce or extend the transition period to less than 12 months.

3.2.2.2.Certification

The certification process is one of the mandatory requirements of organic agriculture. Several studies state that high certification costs are among important entry barriers for organic conversion and production (Strochlic and Sierra, 2007; Constance and Choi, 2010; Indu and Jagathy, 2013). Certification entities make one-year agreements with producers and each entity may demand for different fees; but producers must pay them annually, in Turkey (Er, 2009; Küp et al., 2013). Kenanoğlu and Karahan (2002) implies that there are several government subsidies for certification costs in EU countries; especially in Germany, Austria, Denmark, UK, Switzerland and Italy. Moreover, in UK and Denmark, governments may pay the whole certification costs. In Turkey, a study conducted by Bozyiğit and Kılınç Doğan (2015) shows that organic producers have constraints in terms of high certification costs and procedure in certification process. Ersun and Arslan (2011) express that producers who are unwilling to deal with high costs of certification and conversion to organic production may unethically imitate organic products and lead to unfair competition. They also state deficiencies in certification companies in terms of weakness in counselling the producers, lack of qualified staff, not working coordinated with each other. Certification can be provided by both local or international certification companies. Emir and Demiryürek (2014) suggest that Turkey's organic food products are mostly exported to EU and US and in this regard, certification of these products has to better be made by international certification agencies. Rundgren (1998) summarises the advantages and disadvantages of local certification bodies (Table 3.2).

Table 3.2 Advantages and Disadvantages of Local Certification[3]

Advantages
Lower costs for producers
Better knowledge of local conditions and languages
Better information flow between certification body and producer
Develops trust between producer and certifier
More possibilities for making unannounced inspections
Keeps money in the local economy
Disadvantages
Lack of competence and information at start-up phase
Difficulties in obtaining informational recognition
High initial investment costs may take resources from other activities
Conflicts of interest may lead to struggles of control

3.2.2.3.Extensity of Lands

The farmland width is one of the important factors in organic production. Ersun and Arslan (2011) state that in Turkey many conventional and organic farming areas are located close to each other as result of division by inheritance. They are mostly small farmers. The risk of contamination of chemicals used in conventional production to organically grown products may deteriorate organic agriculture. In addition, producers practicing both conventional and organic agriculture together can keep both types of products together and it can be dangerous for the content for these organically grown products. By contrast, Demiryürek (2011) expresses that the conventional agriculture in Turkey is made with lesser chemical inputs per unit than in other countries, and Rehber (2011) adds that there are organic by default areas in Turkey where lands are very suitable for organic agricultural techniques. In Nepal and Bangladesh, Karki et al. (2011), Karki and Dhakal (2009) and Sarker and Itohara (2008) find a significant and positive relationship between farm size and the adoption of organic farming, whereas Işın et al. (2007) do not find any significant relationship in their study of Turkish organic fig farms.

[3] Source: Gungar Rundgren, **Building Trust in Organics: A Guide to Setting up Organic Certification Programs**, Tholey-Theley, Germany: IFOAM, 1998, p 58.

3.2.2.4.Labor Intensity, Knowledge, Education

The organic agriculture needs an important amount of investment on labour. Padel (2001) argues that organic agriculture has a different structure than conventional agricultural system and that it is in fact an information-based innovation. Regarding the labour intensive characteristic of organic agriculture, Turkey has an advantage to convert to organic agriculture as it can increase the employment rate in rural areas and contribute to the growth of organic food sector in the country (Eraslan, 2004). However, organic agriculture requires labour to be educated on organic agricultural techniques, thus seasonal workers must be trained by organic producers (Wynen, 2003; Küp et al., 2013). Hrabalova and Handlová (2006) propose that organic support should include adult education in Czech Republic. Fairweather (1999) and Midmore et al. (2001) argue that conventional producers have lack of information and knowledge on organic movement and this can be considered as a crucial entry barrier in organic food sector. Schneeberger et al. (2002) explain that additional labour requirement is among the major barriers in the adoption of organic agriculture. In Turkey, there is no strong counselling system to support the education of organic farmers, educational programs are only provided by vocational colleges from which graduated technicians are not given any authority or responsibility (Subaşı, 2003; Demir and Polat, 2006; Bayram et al., 2007). Başak et al. (2015) found that producers have the lack of education on organic agriculture and Işın et al. (2007) has found significant and positive relationship between education and converting to organic agriculture in Turkey. However, Kisaka-Lwayo (2008) and Karki et al. (2011) could not found any significant impact in South of Africa and Nepal respectively.

3.2.2.5.Producer Attitude Towards Organic

Another potential constraint for market growth is the attitude of producers towards organic farming. Differences in attitudes of conventional and organic producers have been analysed in several studies (de Buck et al., 2001; Fairweather 1999; Midmore et al., 2001). In their model of the adoption of horticultural technology in the UK, Burton et al. (2003) found gender, environmental attitudes, information networks significant. In the existing literature, the attitude of producers towards organic has been mostly analysed in terms of economic and social motives. Hassall et

al. (1996) find that for 27 % of the participants to their survey, the major motive to produce organic goods is environmental concern whereas concerns about family health is ranked as the second most crucial driver, followed by the motive to secure the long-term economic viability of their properties and lifestyle. A decrease in costs and attainment of price premiums are determined relatively less crucial. Similarly, Sarker et al. (2010) found that farmers who are more environmentally aware tend to adopt environmentally friendly systems in their farms. In Turkey, Başak et al. (2015) found that organic producers have awareness in terms of environment and health. Kaufmann et al. (2009) discuss that when both economic incentives and social impacts are intertwined and applied together, the rate of adopting organic agriculture increases; but they also imply that economic incentives tend to be more effective than social impacts, in Latvia and Estonia. Similarly, in Belgium, Kerselaers et al. (2007) propose that social impacts such as the opinion of family, colleagues, aversion to change and farmer's risk perception, long-term economic concerns determine the economic potential of farms. Strochlic and Sierra (2007) reveals the social stigma as an important barrier for producers to convert to organic agriculture.

3.2.2.6.Low Demand

Several Turkish studies explain the price premium of organic food products as an important cause for low demand and a barrier for the growth of the supply side in organic food sector (Demiryürek, 2004; Kılıç et al., 2014). Referring to price premiums, Nardalı and Gençler (2011) also point out the low income level of consumers as a barrier for the growth of the organic food market in Turkey. Kerselaers et al. (2007) denote the necessity of price premiums for the growth of the supply side as an encouragement to conventional producers to convert to organic agriculture. Higher costs of labor, inputs and production losses in conversion period can be compensated by price premiums of organic products. Schneeberger et al. (2002) point out that the stability of price premiums can ameliorate both organic food demand and supply. Strochlic and Sierra (2007) express the necessity to increase consumer education and knowledge on organic. Ersun and Arslan (2011) state that limited variety of organic food products may lead to low demand. Information asymmetries also generate an important obstacle for the organic food supply. As a consequence,

consumer mistrust can cause the low demand and negatively affect the supply side of the organic food market. Giannakas (2002) explains that the supply side market failure due to marketing both organic and conventional foods together can be eliminated by providing the information for consumers; thus labeling and certification by third parties can be the only feasible solution and these activities can solve the information problem; but mislabeling conventional products as organic is also an important issue in the market. The information asymmetries in the organic food sector will be discussed in Chapter 4.

3.2.2.7.Government Incentives

Several scholars have concluded that governmental supports in terms of financial, investment aids, area payments, stable price premium offers, tax policies are necessary to stimulate the growth in the organic food sector (Kerselaers et al., 2007; Läpple, 2010;). Area payments as a part of governmental financial aid to farmers have been analyzed and found very important among surveyed farmers in Europe (Acs et al., 2007; Offermann et al., 2009). However, Lohr and Salomonson (2000) denote that services rather than subsidies can motivate and encourage producers in Sweden. There also studies focusing on the importance of the institutional context of organic agriculture including the relationships with the organic market, agricultural sector, civil society (Michelsen et al., 2001; Moschitz et al., 2004). In Turkey, Demiryürek (2011) points out the improvements that are needed to stimulate the growth of organic food supply such as increasing the amount and the number of the governmental incentives during the conversion period to organic agriculture, providing education, supporting NGOs, generating the coordination between governmental bodies, NGOs and producers, enhancing R&D activities, lower interest rates, premium price, broadcasting about the organic agriculture, establishing pilot projects in suitable places for organic farming in order to adopt organic agriculture to producers, supporting organic livestock and aquaculture production in export market, facilitating the process of control and certification and the organic legislation for compliance with the EU, coordinating a high committee in order to take decisions in organic agriculture.

3.2.2.8.Other Costs and Constraints

Limited variety of organic food products can be an important constraint in the growth of the organic food sector in Turkey and it can be an obstacle to reach the economies of scale in organic food production (Demiryürek, 2011). According to Küp et al. (2013), it is difficult and dangerous for an organic producer to borrow or give machines such as sprayers, trailers and the equipment of organic agriculture can be costly for small-sized enterprises. The lack of accredited laboratories in Turkey is an important constraint as the analyses for residues of pesticides, additives etc. are carried out abroad (Bayram et al., 2007; Demiryürek, 2011, Başak et al., 2015). Additional paper works needed for the organic agriculture activities may also discourage producers to adopt organic agriculture (Schneeberger et al., 2002). Strochlic and Sierra (2007) state marketing problems as important constraints in the organic food supply. In addition, retailers' costs as shelf rents, marketing costs are important obstacles for organic producers; whereas the lack of markets and selling points that bring local producers directly to the consumer and the limited number of NGOs and associations that will provide them are among the major concerns in organic food supply in Turkey (Demiryürek, 2011). The limited implementation of organic agriculture in certain areas also creates higher transportation costs to producers. The organic food demand has increased in metropolitan cities in Turkey recently; thus fresh organic food products have been transported across the country and their marketing is operated by intermediary companies (Akgüngör et al., 1999). Nardalı and Gençler (2011) add that direct marketing has a minor role in wholesale distribution system due to the long transportation distances between production places and final selling points.

3.3.RESEARCH DESIGN, STATISTICS, AND ECONOMETRIC MODELS

3.3.1. Research Design

We have conducted a producer survey of 31 questions to 254 participants in industrial regions of Turkey[1]. The study aims to describe the profile of organic food producers in terms of socio-economic and firm characteristics; constraints and entry barriers that prevent the potential growth of organic food market in Turkey. So, the survey is conducted to randomly chosen producers referring to the quota of producer numbers in each region in Turkey. Our survey is conducted to the executive employers including farmers, processors, and traders affiliated with the professional commerce and industrial chambers in each region. 13 questions including socio-economic and firm characteristics are asked to both organic and conventional producers. Then, organic producers are given 11 additional questions whereas conventional producers, 7 additional questions to investigate their type specific experiences.

Socio-demographic variables such as ***age, education level and gender*** are crucial to characterize producers in order to understand who practices organic agriculture activities. In order to highlight firm specific characteristics, questions such as ***entry year to the food sector, number of employees, place of production, product types, annual amount of production, place of sales, R&D involvements, incentive use, memberships of both workers and employers in professional associations*** were presented. Regarding the literature, environmental concerns are important drivers to convert to organic agriculture; consequently, we asked questions related to environmental awareness. The questions include ***specification of production country, whether the production is made in an environmentally friendly environment, whether there is proper packaging for recycling and whether or not the food***

[1] For the survey questions, see the Appendix C.

contains chemicals. Moreover, producers ranked their ***knowledge on environmental issues like acid rains, water pollution, carbon emissions and greenhouse gas releases and world hunger***. Besides, questions concerning the importance of environmental pollution, contribution to recycling and ecological selectiveness in food consumption are asked.

The survey includes questions related to entry barriers to organic food market based on the literature survey. These are ***certification costs, conversion period longitude, retail and transportation costs, low demand, land disadvantage, insufficiency of government incentives, unawareness of "organic" term in society, lack of consumer knowledge, consumer mistrust, lack of broadcasting and representation of organic in media and in public, insufficiency of NGOs, lack of organic agricultural units in provinces and districts, insufficiency of the database system, the multiplicity of imported organic food products in the market, lack of employee knowledge, higher unit costs comparing with conventional food products***. Producers are asked to rank each entry barrier's importance. These questions provide us the opportunity to look into entry barriers from the point of view of organic food producers who have already experienced these and conventional producers who anticipate these barriers.

3.3.2. Statistics

In the survey, almost 64% of the participants are conventional producers with 162 respondents and 36% are organic producers with 92 participants. Table 3.3 shows the socio-demographic characteristics of our sample. Organic producers in our sample are mostly men aged between 30-45 years, with college degree; 37% produce only organic food products whereas for 43%, 50-90 % of their production consists of organic food. Regarding the years of entry into the food sector, the data ranges from 1881 to 2017. The regulation on organic agriculture came into force in 2004 and organic agriculture has gained an official structure. Consequently, producers can be categorized as incumbents and new entrants given their entry years to organic food sector in Turkey based on this reference year. 54% of the organic producers have entered in the organic food market after 2004 in our sample. Regarding the employee

numbers in organic food production, 26% of organic producers are small-size businesses, whereas 55% are medium-size and almost 19% are large and very large-size businesses. Producers operate mostly in Marmara, Aegean, Central Anatolia, and Mediterranean regions of Turkey.

The majority of the participants (57%) are wholesalers, the selling points are 42% specialty shops, 41% supermarkets, 21% discount markets, 9% open bazaars, 7% online sale channels, 6% organic bazaars, 5% organic bazaars and only 3% farms. Regarding the distribution channels of organic products, the majority of organic producers in our sample (57%) are wholesalers, whereas 51% claim that they sell their products at supermarkets. 40% identify their selling points as specialty shops. The list of selling places and their frequency are given in Table 3.4. There are 17 types of products and the detailed information on the production share of food products is shown in Table 3.5 (the list does not include baby food because in our sample none of the producers produce baby food). Regarding organic product categories, the organic producers in our sample are most frequently producing organic bakery products (20%), following by organic meat and meat products (18%). The amount of annual production has been demanded however most of the producers were unwilling to respond and only 25% of the producers in our sample (only 23% of organic producers) have claimed that they use government incentives. Table 3.6 shows the frequency of using incentives in our sample.

Approximately half of them invest in R&D activities. Regarding the membership in unions and professional associations, only 6% of participants indicate that their employees are members of unions and professional associations. By contrast, 56% of employers state that they are members of unions and professional associations. They claim that they are mostly members of export, commerce, industrial chambers; producers', employers', food engineers' associations. While only 4 out of 92 organic producers have claimed that their workers are members in professional unions and associations. However, 61% of the organic producers in our sample have told that they are personally members of unions, professional associations and chambers. Besides, 55% have claimed that they have involved in R&D activities. Referring to the literature we have asked our participants about the nationality of the control and certification

companies that they have agreements, and 88% of the organic producers in the sample have contracted with national control and certification companies. In terms of education, only 25% of the organic producers claimed that their workers have no education, whilst 47% expressed that their workers have no education on organic agriculture. 53% have claimed that their workers have organic training and education programs, whereas 33% have told that their workers have organic education and training programs from the Ministry of Agriculture and Forestry, Turkey. As employers, almost 59% have claimed that they have education and training programs on organic agriculture.

Table 3.3 Socio-demographic Characteristics of the Sample

Socio-demographic characteristics	All (%)	Organic (%)
Gender		
Male	70.87	76.09
Female	29.13	23.91
Age		
18-29 years	20.47	17.39
30-45 years	57.48	63.04
46-60 years	20.47	18.48
61 years and older	1.57	1.09
Education		
Primary School	1.97	0
Middle School	1.97	1.09
High School	16.93	20.65
College	66.54	69.57
Master/PhD	12.6	8.70

Table 3.4 Frequency of Distribution Channels in the Sample

Distribution Channels	Total	Organic
Supermarket	105	105
Discount market	54	54
Open Bazaars	23	23
Organic Bazaars	14	14
Organic and Natural Shops	12	12
Specialty Shops	108	108
Farms	8	8
Online Channels	18	18
Wholesale Channels	145	145

Table 3.5 Product Types

Product Type	All (%)	Organic (%)
Fresh fruit and vegetables	3.94	5.43
Meat	20.47	18.48
Milk	7.48	9.78
Cereal	4.33	5.43
Bakery	28.74	19.57
Legume	3.54	3.26
Egg	0.39	2.17
Fertilizer	1.57	1.09
Dried fruit, vegetables and nuts	5.91	7.61
Drinks	9.06	11.96
Oil	5.51	6.52
Sugary products	7.09	11.96
Sweet snacks	7.09	5.43
Olive	1.18	2.17
Spice	3.15	2.17
Seed	5.12	1.09

Table 3.6 Frequency of Incentive Use by Organic Producers

Incentive Type	Use of Incentive		
	Using	**Not Using**	**No Information**
Lower Interest Rate	9	238	7
Financial Aid per Hectare	5	240	9
Data System	3	241	10
Bank Loan	13	235	6
SME Aid	9	238	7
R&D Support	6	241	7
Broadcasting Support	3	243	8
Other Incentives	6	244	4

As the study aims to reveal constraints and entry barriers in organic food market in Turkey, the participants have been asked to rank entry barriers and constraints such as certification, transportation, retail and unit costs, soil analysis and conversion period longitude, low demand, land disadvantage, lack of government incentives, unawareness of "organic" term in the society, lack of consumer knowledge, mistrust of consumers, lack of broadcasting, NGOs and organic agricultural province units, insufficient data systems, multiplicity of imported organic goods, employee ignorance in the market. Table 3.7 shows the shares of organic and conventional producers who have stated that they have no information on each constraint and entry barrier. For soil analysis and conversion period difficulties and land disadvantage, there is a significant share of the producers having no information. These items were not used in the econometric estimations. This may be due to the fact that some producers are manufacturers and some farmers have adopted organic agricultural practices as contractual agriculture with foreign companies and these carried out most of the conversion procedures.

Table 3.7 Producers having no Information about Entry Barriers and Constraints

Percentages of producers who have no information about entry barriers and constraints			
Entry Barrier	**Organic (%)**	**Conventional (%)**	**Total number**
Certification cost	34	66	41
Soil analysis and conversion period longitude	31	69	103
Retail cost	31	69	36
Transportation cost	36	64	11
Low demand	56	44	9
Land disadvantage	34	66	61
Lack of government incentives	50	50	22
Unawareness of organic term	28	72	18
Lack of consumer knowledge	66	34	3
Consumer mistrust	40	60	5
Lack of broadcasting	29	71	14
Lack of NGOs	46	54	24
Lack of organic agricultural province units	23	77	30
Insufficiency of data systems	29	71	31
Multiplicity of imported goods in the market	28	72	32
Employee ignorance	66	33	3
More unit cost than conventional products	47	53	17

3.3.3. Econometric Models

3.3.3.1. Organic Food Producers in Turkey

The study aims first to differentiate organic producers form conventional ones, to be able to characterize the motivations for entry in the organic food market. We have applied binary logistic model to our data to determine the profile of the organic producers. The dependent variable is the dummy for organic production (1 for organic producers and 0 for conventional producers). The econometric model is constructed

with control and independent variables on which the existing literature is concentrated. First, the data has been tested for multicollinearity. Some entry barriers and constraints are highly correlated, so that these were excluded from the model, a detailed explanation on the methodology is given in Appendix A. In the Appendix C, the detailed information about all dependent, control and independent variables are given.

Table 3.8 shows the results of this first econometric model. Regarding the education level, there is an insignificant and negative result between education level and being an organic producer. This result is not in line with the literature finding a significant relationship between producers' lack of education and entry to the organic food market. While producers employing trained workers are significantly less likely to be an organic food producer. Employers being members to unions and professional associations are significantly more likely to be organic producers (2.3 times). Employee number has a positive impact on the likelihood of being an organic producer but this effect is insignificant.

Regarding the environmentally consciousness, there are several variables. Instead of looking at the impact of each, we have calculated their mean and created an environmental consciousness variable. Producers who are more environmentally conscious are significantly more likely to be organic food producers (2 times). Turkish organic legislations propose a large range of government incentives to encourage producers to convert to organic production, participants were asked whether they use any government incentive or not. We do not find any significant relationship with incentive use contrary to the anticipations in the literature.

In terms of their experiences and anticipations on constraints and entry barriers in Turkish organic food sector, transportation costs, unawareness of the term "organic" in the society, multiplicity of imported organic products in the market as constraints in the organic food market are significant determinants of the likelihood of being an organic producer. Odds ratios show that producers considering transportation costs and multiplicity of imported organic products in the market as constraints in organic food market are 1.65 and 1.9 times more likely to be organic producers, respectively. Moreover, consideration of certification costs as a constraint is positively correlated

with being an organic producer at the significance level of 88%. On the other hand, employee ignorance is negatively and significantly correlated with being an organic producer. Conventional food producers anticipate lack of employees' education on organic production as an entry barrier, whereas organic producers mostly experience constraints in terms of demand, and production costs.

Table 3.8 Econometric Model 1: Organic Food Producers in Turkey[1]

EDUCATION.2	-0.310 (1.473)	EMPNUMBER.2	2.237 (1.440)
EDUCATION.3	-0.699 (1.458)	EMPNUMBER.3	2.095 (1.466)
EDUCATION.4	-0.516 (1.571)	EMPNUMBER.4	1.801 (1.630)
CERTCOST	0.416 (0.267)	EMPLIGNORANCE	-0.646* (0.337)
TRANSCOST	0.507* (0.302)	MOREUNITCOSTCONV	-0.00407 (0.334)
LOWDEMAND	-0.127 (0.288)	WORKEREDUC.1	-0.926* (0.559)
LANDDISADV	-0.137 (0.263)	EMPLOYERUNION	0.834** (0.411)
LACKGOVINCENTIVE	-0.282 (0.235)	ENVCONSCIOUSNESS	0.720** (0.302)
UNAWARENESS	0.492* (0.290)	INCENTIVEUSE	-0.170 (0.526)
DATASYSTEM	-0.187 (0.290)	Constant	-7.043** (2.749)
IMPORTEDGOODS	0.649** (0.262)	Observation	149
		Pseudo R^2	0.1798

[1] Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

3.3.3.2.The Supply Side of Organic Food Market

In the second part of the study, we tested four econometric models in order to see the differences between organic food producers. We have applied binary logit regression models where the dependent variables are designed in accordance with the producer's entry year to organic food sector in Turkey, firm size and whether the producer produce raw or processed products. In econometric models, there may be some problems in the adoption of the variables into the model. In order to determine the best model, we have applied stepwise selection method by adding variables into the model. As Appendix A explains, we have used VIF analysis and correlation matrix to eliminate the collinearity problem in the regression, for this reason we excluded some variables this problem from the model. The description of variables is given in Appendix C.

In the first model, the dependent variable is whether the producer is an incumbent firm or a new entrant to sector (0= New entrant, 1= Incumbent). Due to the introduction of the organic agriculture law in 2004, we have classified the base year as 2004 and designed the model of entering into the organic food sector as before and after 2004. R-square is 0.2717 showing that 27.17% variation of incumbent organic food producers is accounted by our model. The results of the model are shown in Table 3.9.

To define organic producers profile, analyzing firms and producer characteristics is important. In the first model, it is seen that medium and large sized firms are less likely to be incumbent firms as there are negative and significant impacts on medium and large firm sizes on being incumbent. Similarly, being environmentally conscious is negatively and significantly correlated with being an incumbent firm, thus it is possible to argue that new entrant organic producers have more environmentally conscious.

In terms of unionization, the model demonstrates that producers with membership at unions and professional associations are more likely incumbent firms in the organic food sector. Moreover, using government incentives have positive but

insignificant correlation with being an incumbent firm, whilst the significance level is 80% and the model shows that organic producers using government incentives are 4 times more likely to be incumbent firms.

The model also looks into the advertising places in order to get a better understanding for firm characteristics. It is seen that there is positive and significant relationship between being an incumbent firm and having advertisements in press and organic food producers who advertise their products in press are 5.4 times more likely to be incumbents. Whereas having advertisements at shopping places has a negative and significant impact on being an incumbent firm. Also, having advertisements on billboards has a positive but insignificant relationship with being an incumbent firm; the significance level is around 88% and organic producers that have advertisements on billboards are 2.25 times more likely to be incumbents. In terms of certification, organic producers that have contracts with international control and certification bodies are 4.62 times more likely to be incumbent firms in the sector.

New entrants and incumbent firms are segregated in terms of constraints and entry barriers in the sector. Experiencing the lack of organic agricultural province-district units as a constraint has a negative correlation with being an incumbent firm at the significance level of 95%. On the other hand, experiencing data system insufficiencies as constraints has a positive and significant impact of being an incumbent; and organic producers who experience data system insufficiencies are 3 times more likely to be incumbent firms' employers. It is important to note that, considering transportation cost as a constraint has a negative correlation with being incumbent firm at the significance level of 84%. Experiencing unawareness of the "organic term" in the society as a constraint is positively related to be an incumbent firm at the significance level of 82% and organic producers who experience this constraint are 2.1 times more likely to be incumbents.

Table 3.9 Differences Between Organic Food Producers in terms of Entry Year[2]

TRANSCOST	-0.655 (0.466)	EMPNUMBER.2	-4.563* (2.386)
LACKGOVINCENTIVE	0.211 (0.413)	EMPNUMBER.3	-3.768* (2.205)
UNAWARENESS	0.743 (0.550)	CERTNATIONALITY.2	1.530 (1.263)
NOPROVINCEUNIT	-1.679** (0.686)	WORKERORGEDUC	0.648 (0.938)
EMPLIGNORANCE	-0.494 (0.639)	WORKEREDUC	-0.369 (0.851)
IMPORTEDGOODS	-0.600 (0.540)	EMPLOYERUNION	1.810** (0.865)
DATASYSTEM	1.114* (0.578)	ENVCONSCIOUSNESS	-1.038* (0.601)
ADVPRESS	1.690* (1.001)	INCENTIVEUSE	1.401 (1.052)
ADVBILLBOARD	0.815 (0.528)	Constant	11.27** (5.447)
ADVSHOPPLACE	-1.591** (0.746)	Observation	67
		Pseudo R^2	0.2717

[2] Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3.10 Differences Between Organic Food Producers in terms of Firm Size[3]

TRANSCOST	0.563 (0.599)	CERTNATIONALITY.2	-1.254 (1.171)
LACKGOVINCENTIVE	-0.532 (0.365)	WORKERORGEDUC	0.354 (0.917)
UNAWARENESS	0.512 (0.521)	WORKEREDUC	1.806* (0.953)
NOPROVINCEUNIT	0.716 (0.693)	EMPLOYERUNION	-1.206 (0.813)
EMPLIGNORANCE	-1.120* (0.678)	ENVCONSCIOUSNESS	1.076* (0.602)
MOREIMPORT	0.671 (0.529)	INCENTIVEUSE	-0.425 (1.000)
DATASYSTEM	0.0660 (0.472)	ENTRYYEAR	-0.0218 (0.0324)
ADVPRESS	-1.162* (0.698)	Constant	32.98 (64.12)
ADVBILLBOARD	0.669 (0.547)	Observation	68
ADVSHOPPLACE	0.926* (0.493)	Pseudo R^2	0.3115

[3] Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3.11 Differences Between Organic Food Producers in terms of Product Type[4]

CERTCOST	-1.433** (0.571)	EMPNUMBER.2	0.877 (3.531)
TRANSCOST	1.233* (0.659)	EMPNUMBER.3	-0.0599 (3.476)
LACKGOVINCENTIVE	-0.259 (0.515)	EMPNUMBER.4	-3.331 (3.601)
UNAWARENESS	0.462 (0.634)	CERTNATIONALITY.2	-0.909 (1.230)
LACKBROADCASTING	1.319* (0.699)	WORKERORGEDUC	-0.408 (0.919)
NOPROVINCEUNIT	-2.232** (0.960)	WORKEREDUC	1.841** (0.885)
EMPLIGNORANCE	-0.412 (0.710)	EMPLOYERUNION	0.956 (0.813)
MOREIMPORT	0.604 (0.608)	ENVCONSCIOUSNESS	-0.0407 (0.658)
ADVPRESS	-0.442 (0.773)	INCENTIVEUSE	0.376 (1.082)
ADVBILLBOARD	-0.281 (0.501)	Constant	1.022 (6.210)

[4] Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3.12 Differences Between Conventional Food Producers in terms of Entry Year[5]

PRODUCTTYPE	0.609 (0.589)	EMPNUMBER.2	0.448 (0.911)
CERTCOST	0.207 (0.330)	EMPNUMBER.3	-0.424 (0.952)
TRANSCOST	0.643 (0.426)	EMPNUMBER.4	-0.203 1.305)
LOWDEMAND	-0.107 (0.369)	WORKEREDUC	0.812 (0.899)
LANDDISADV	-0.103 (0.371)	EMPLOYERUNION	-0.968* (0.570)
UNAWARENESS	0.245 (0.329)	ENVCONSCIOUSNESS	0.218 (0.309)
NOPROVINCEUNIT	-0.455 (0.520)	INCENTIVEUSE	1.877** (0.828)
DATASYSTEM	0.616 (0.441)	Constant	-4.701 (3.100)
IMPORTEDGOODS	-0.312 (0.287)	Observation	91
EMPLIGNORANCE	-1.930*** (0.673)	Pseudo R^2	0.1978
MOREUNITCOSTCONV	1.849** (0.769)		

[5] Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In the next model, we have tested organic food producers type in accordance with their firm size to better understand the differences between producers. The firm size variable is generated from employee numbers of producers. In the survey, we have asked participants to define their employee number in the categories of 1-9 employees for small firms, 10-49 for medium sized firms, 50-249 to large sized firms and more than 250 employees for very large sized firms. Since there were very few of very large sized firms, we have merged large and very large sized categories. We also merged small and medium sized firms and obtained a dependent variable (0= small and medium sized firms, 1= large sized firms). R-square is 0.3115 showing that 31.15% variation of large sized firms is accounted by our model. Table 3.10 demonstrates the results of the model.

In terms of organic producer profile, there is a positive and significant relationship with being a large-sized firm and having environment consciousness and environment conscious producers are 2.94 times more likely to have large sized firms. While looking into education, having educated and trained workers as the impact of worker education is positive and significant; producers having educated and trained workers are 6 times more likely to be large sized firm employers. In addition, large-sized firms less likely consider employee ignorance as a constraint and entry barrier in the sector as the variable of employee ignorance is negatively and significantly correlated with the dependent variable. It is possible to argue that large sized firms have more invested in education.

It is important to denote that, in terms of constraints, experiencing the lack of government incentives is negatively but insignificantly correlated with being a large sized firm whilst the significance level is 85%. Similarly, having memberships at professional associations and unions is negatively correlated with being a large sized firm and the significance level is 86%. When we looked into the odds ratio, organic producers who experience the lack of organic agricultural province/district units are 2 times more likely to be large sized firm employers. Moreover, organic producers who consider the multiplicity of imported organic food products as a constraint in the market are 1.95 times more likely to be large sized firms.

The model also shows that small-medium sized and large sized firms are differed in term of advertising. It is seen that having advertisement in press is negatively and significantly, whilst having advertisements at shopping places is positively and significantly correlated with being a large sized firm. It is shown that organic producers having advertisements at shopping place are 2.52 times more likely to be large sized firm employers.

The fourth model takes into account the product type of the producers. Since the producers are asked to define the organic food products that they produce, we have categorized them as producing raw or processed food products. We have categorized raw products as fresh fruit and vegetables, meat, milk, olive, egg, seed, spice, cereal; and processed products as oil, sugary food, sweet and chocolate snacks, dried fruits, vegetables and nuts, bakery products, drinks, baby food, fertilizers and legumes. Thus, the dependent variable in this model defines whether the producers raw or processed products (0=raw products, 1= processed products). It is important to note that in case a producer produces both raw and processed products, he/she is included in producing raw products group. R-square is 0.2989 showing that 29.89% variation of organic processed food producers is accounted by our model. The result of the model are given in Table 3.11.

In terms of education, the model shows that processed food producers have more likely educated and trained workers as there is a positive and significant impact on worker education at the level of 95% and organic producers having educated and trained workers are 6.3 times more likely to be organic processed food producers. In terms of advertising, the impact of having advertisements at shopping places is positive but significant at the level of 86% and organic producers having advertisements at shopping places are 2.83 times more likely to be organic processed food producers. The model also demonstrates that organic producers having memberships at professional associations and unions are 2.6 times more likely to produce organic processed food.

The model gives an understanding in differentiating organic raw and processed food producers in terms of constraints. Organic process food producers are less likely experience the certification cost, the lack of organic agricultural province-district units as constraints since the correlations between being a proceed food producer and considering these as constraints are negatively correlated at significance level of 95%. On the other hand, organic processed food producers more likely consider transportation cost and the lack of broadcasting as constraints, because these variables are positively and significant correlated with producing organic processed food. It important to note that organic producers that have experienced them as constraints are 3.43 and 3.73 times more likely to be organic processed food producers respectively.

We also generated a model to analyze conventional food producers in our sample in accordance with their entry year to food sector as the base year is taken as 2004 where the organic law has constructed in Turkey; the dependent variable is binary and represents as 1= entry to food sector after 2004, 0= entry to food sector before 2004. With variables defining entry barriers to organic food sector, we aimed to understand new and incumbent firms' opinions on entry barriers. R-square is 0.3115 showing that 31.15% variation of new conventional firms is accounted by our model.

Table 3.12 shows the results of the model and it is seen that being new firms and having memberships to professional associations and unions are negatively and significantly correlated. Besides, firms using government incentives are 6.5 times more likely to be new firms as there is a positive and significant relationship between being new firm and using government incentives. In terms of entry barriers into the organic food sector in Turkey, there is a negative and significant correlation between anticipating employee ignorance as an entry barrier and being a new firm; whilst there is positive and significant relationship between considering more unit cost of organic food products rather than their conventional counterparts as an entry barrier. The model expresses producers that anticipate higher unit cost of organic food as an entry barrier are 6.3 times more likely to be new conventional firms. It is important to indicate that entry barriers such as data system insufficiency and transportation costs have positive impacts on being new firms at the significance levels of 84% and 87% respectively. Table 3.13 summarizes the results of the previous four econometric

models. This table may help to formulate policy measures in case of intervention in the organic food market.

Table 3.13 Significant Characteristics of Producer Groups

		Organic Food Producers						Conventional Food Producers	
		Incumbent	New Entrant	Small/ Medium Scale	Large Scale	Raw Food Producers	Processed Food Producers	Incumbent	New Entrant
Environment Consciousness			✓		✓				
Members of Professional Ass. And Unions		✓						✓	
Worker Education					✓		✓		
Incentive Use									✓
Advertising	Press	✓		✓					
	Shopping Places		✓		✓				
Constraints	Lack of Province Units		✓			✓			
	Data Syst. Insufficiency	✓							
	Transportation Cost						✓		
	Employee Ignorance			✓				✓	
	The Lack of Broadcasting						✓		
	More unit cost of organic food								✓

3.4.CONCLUSION

This chapter aims to reveal the prospects in the organic food supply in Turkey. Turkey has a great potential for organic agriculture practices and it is ranked as first in Europe and eight in the world with the highest number of organic producers. This study focused on profiling organic producers in terms of environmental consciousness, entry constraints in the organic food market and firm characteristics. At first, we have tried to determine characteristics differentiating organic and conventional food producers. Then, we have categorized organic producers in terms of their entry years to the sector (based on 2004 the year when the organic law has been registered in Turkey), firm size and product type.

In the first model, organic and conventional food producers are segregated in terms of their experience and anticipation of constraints and entry barriers in Turkish organic food sector. The model shows that Turkish organic food producers have experienced production costs, unawareness of consumers and the presence of imported products as constraints; thus it is possible to say that they mostly face production and demand side uncertainties. However, conventional food producers in our sample have a tendency to anticipate education as an entry barrier. Conventional producers are significantly more likely to have educated and trained workers. We can say that they appreciate the impact of education and training and they consider their lack of education as a problem in entering the organic food market in Turkey. It is also important to note that, the majority of the producers in our sample stated that they do not use government incentives, and most of them have limited information on production process in organic management. In terms of organic food producer profile, our results show that organic food producers are more environment-conscious than conventional food producers. Our results match the results of several studies finding that environmental awareness is one of the main motives in adopting organic agriculture (Zagata, 2008; Sarker et al., 2010). In the literature, several scholars have highlighted the importance of unionizing as policy requirements (Demiryürek, 2011;

Nardalı and Gençler, 2011). It is seen that organic producers are more unionized than conventional producers in our sample. As product group certification takes place in Turkey, and production sites are mainly concentrated on Aegean and Mediterranean regions, organic food producers are now more involved in joint actions.

Next, the comparison of organic food producers in terms of their entry year to the sector, firm size and product type is made. Incumbent firms in the sector experience infrastructural problems in data systems such as OTBIS as an entry barrier whereas new entrants deal with access to shopping places and the lack of organic agricultural province and district units. Moreover, incumbent firms are more unionized than new entrants in the market. The results highlight the need of institutional support for incumbents and new entrants. From environmental perspective, new entrants are more environment-conscious.

In terms of firm size, large-scale organic producers are differentiated from small scale producers by their environment-consciousness, educated and trained staff and access to shopping places. These are in line with the necessities and benefits of larger scale of production. Whereas small and medium scale organic producers experience the lack of employee education and knowledge as a constraint in the sector. There are vocational schools providing education on organic agriculture. However, the graduates are not eligible in the sector as they do not have any license to work as technicians or controllers. A proper regulation such as the introduction of specific courses to provide opportunities for graduates to become technicians may promote employee education in small and medium scale organic firms.

We see that organic processed food producers are differentiated by raw food producers by their perception of transportation cost and lack of broadcasting as constraints, organic raw food producers on the other hand deal with certification costs and the lack of organic agricultural province and district units as main problems. It is possible to argue that raw food producers are focused on institutional and production oriented problems whereas processed food producers deal with distribution and marketing problems generally.

We have looked into conventional food producers in terms of their entry year as after 2004 the new comers was facing a more structured organic food market compared with incumbents. The new comers anticipate higher unit cost as constraints whereas incumbent firms consider the lack education and knowledge of employees as an entry barrier in the organic food sector. The reason behind this may be their lack of flexibility and in the sector and that the feeling of incompetency related with it. New comers among conventional food producers may not be aware of financial supports in organic agriculture as they consider high unit costs as an entry barrier. Promoting government financial aids in the organic food market may encourage newly established firms to convert to organic production.

With regard to advertising, incumbents and small/medium scaled organic producers have advertisements in press whereas new entrants and large scaled organic producers mostly advertise at shopping places. In our sample, organic producers sell their products mostly in supermarkets, specialty shops and through wholesale distribution. There must be improvements in supply chain distribution since the marketing of organic food products is an important tool to increase the demand. NGOs and government can help to direct organic producers to organic bazaars as they sponsor most of the organic bazaars. They can also increase the number of these places to attract organic food consumers.

The existing literature denotes the positive impact of governmental incentives in adopting organic agriculture. We tested whether using governmental incentives is an important determinant of being an organic producer and found no impact of government incentive use in organic food production. When we look into statistics, 21 out of 91 organic producers in our sample benefits from government incentives. The ratio is very low, thus government institutions must inform organic producers about its incentives in organic agriculture, also implement new incentives in this topic. It is also noteworthy to mention that there are high volatilities in the frequency and amount of financial supports in organic agriculture. There are abuses of financial aids e.g. land owners who have no organic production benefit from area payments that are given to lands with no application of fertilizers. To prevent such cases, financial incentive

mechanism must be designed carefully and legislations must be clear about the requirements and conditions for beneficiaries of these incentives.

4. ASYMMETRIC INFORMATION IN ORGANIC FOOD MARKET

4.1.INTRODUCTION

Organic agriculture not only ensures to protect and sustain soil fertility, but also it provides high quality food for consumers (Kilcher, 2007). Both consumers and farmers have demands for good food products (Eurobarometer, 2017). Organic food has been a niche product for decades and it has becoming more a necessity food product since the health and environmental concerns of consumers have risen. It also refers a guaranteed product of a system, which sustains health of soil, all living being on the planet and strictly forbids the use of artificial inputs and GMOs (IFOAM, 2018a). As organic principles are based on healthcare, environment protection, animal welfare, biodiversity and sustainability, organic products have been becoming differentiated from their conventional counterparts. Consumers value organic products differently as they interest in products that can satisfy their concerns in terms of health, environment and sustainability (Schleenbecker and Hamm, 2013).

The range of organic food have coupled rapidly as the sector has become more dynamic and obtained a high rate of growth. As mentioned in previous chapters, its sales volume has reached more than 80 Billion USD globally. FAO (2018c) states that the lack of external agricultural inputs consequently makes organic agriculture a more labor intensive system. Despite the constraints and high costs of organic production, the supply of organic food has a rapid growth. In Turkey, there are more than 75,000 organic producers as of 2017. Capturing price premiums of organic food products is an important motive for producers to convert to organic production (Allen and Kovach, 2000). Economic Research Service (ERS) has a study proving that organic food

products are costly than their conventional counterparts and the price premium was above 20% (Carlson, and Jaenicke, 2016).

Since the profitability of organic production is tempting for producers, there are some cases in which conventional products are mislabeled as “organic”. Such fraudulent cases cause asymmetric information problem in the market. As McCluskey (2000) defines, food products are credence goods by their nature. Organic food products are also classified as credence good as consumers cannot detect the organic authenticity even after the consumption (Nelson, 1970).

Regarding the increasing supply in the organic food sector in Turkey, the shares of organic agricultural lands and organic producers are quite low in aggregated numbers of lands and producers in the country. Figures 4.1 and 4.2 show the shares of both organic lands and organic producers in total agricultural lands and producers respectively. The share of organic lands in total agricultural area is 1.4%. It is declined from 2015 as the forest and 2B areas are excluded from the statistics. Figure 4.2 shows that organic producers account for 3.5% of producers in 2017.

The existence of mislabeled conventional products in the market may be problematic; it can incur lesser producers to enter the organic food sector, and limit the growth of the sector. To prevent the asymmetric information, some regulatory precautions have been made and improved by governments. Since the demand for organic products has been growing, consumers need more information on the organic good and therefore implementing organic standards became substantial in order to guarantee and signal the high quality of organic food for consumers. Globally, 178 countries have their own national standards and the third party certification and labelling are mandatory in the marketing of organic products in order to identify and monitor the authenticity of organic in many countries. Despite these precautions in terms of implementation of standards, certification and labelling; such fraudulent cases are still present.

This chapter aims to reveal an asymmetric information model while analyzing the information and concern levels of organic food consumers, mislabeling possibility of producers and policy requirements in the organic food market in Turkey. In section

2, we will address the literature review; thus we will represent our model in section 3. In section 4 we will discuss the results of the model and discuss possible policy implementations.

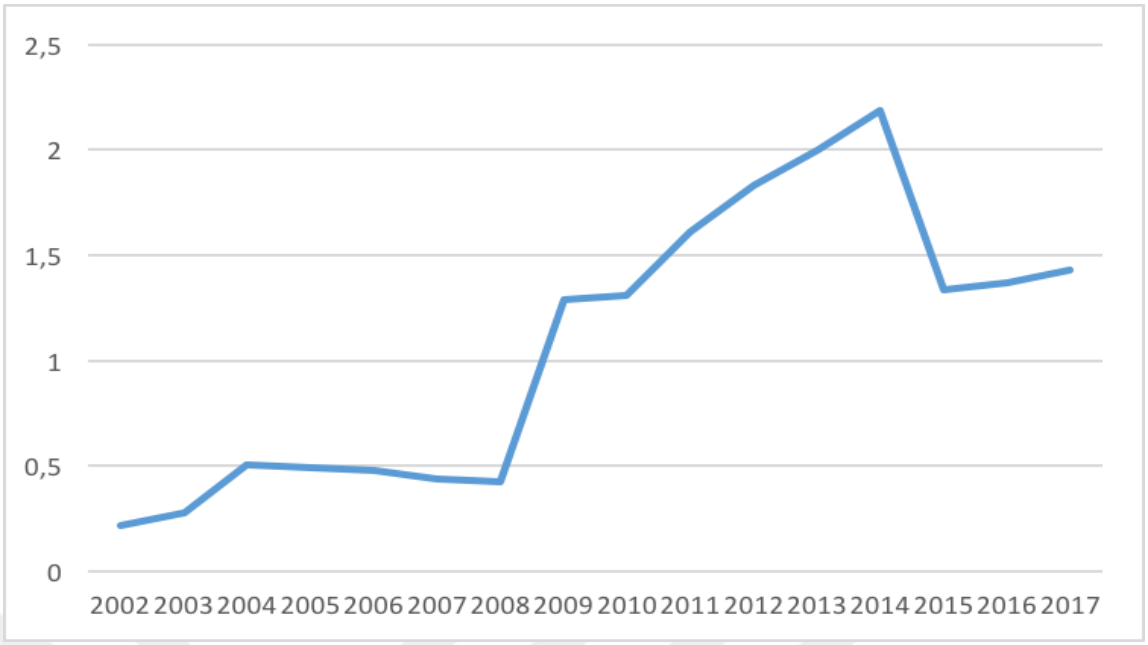

Figure 4.1 Share of organic agricultural lands in total agricultural lands in Turkey, 2002-2017 (%)[1]

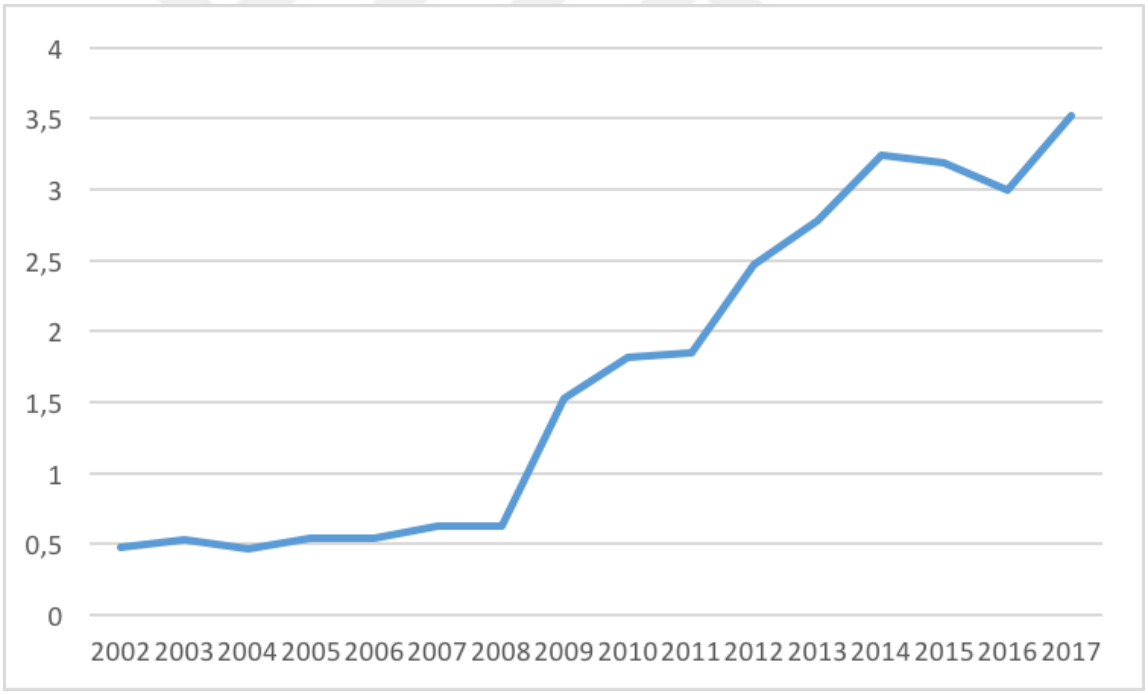

Figure 4.2 Share of organic producers in all producers in Turkey, 2002-2017 (%)[2]

[1] It is elaborated from the data provided by The Ministry of Agriculture and Forestry, Turkey, Official Website: https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler, 2018.
[2] Ibid.

4.2.LITERATURE REVIEW

The studies conducting on organic food market are mostly focused on consumer preferences and behaviors. Studies on the supply side of the organic food market have focused on entry barriers and constraints, profitability of organic farms and modeling organic agriculture assuming that there is a perfect information in the market. (Giannakas, 2002). In this section, we will reveal the literature focusing on the credence nature of organic food, the asymmetric information problem in organic food market and product differentiation. After expressing the theoretical framework, we will discuss related case studies.

4.2.1. Asymmetric Information

In economic theory, all actors are assumed to have perfect information, since Stigler (1961) introduced "Economics of Information". Akerlof (1970) introduced a wider approach in this field, he investigated the asymmetric information in second hand car markets. The theory refers to a situation where the seller possesses the information whereas the buyer does not, in the same trade. From 1970s, the theory has become a pioneer in the modern economic thought (Do, 2003) and has been mostly applied in fields like financial services, insurance, second hand car and labor markets (Akerlof, 1970; Spence, 1973; Stiglitz and Weiss, 1992). In the theory, two actors are defined as the Principal and the Agent, where the Agent has the information and the Principal has limited information on whether the Agent has the properties that he claims. In asymmetric information problems, moral hazard exists where the Agent's actions cannot be detected after the contract and adverse selection occurs where good properties of the Agent are hidden from the Principal before the contracts (Akerlof, 1970).

Food products have unknown characteristics by their nature and Nelson (1970) defines food products as experience and credence goods. McCluskey (2000) categorizes food products into 3 types; *(1) search goods*, like parsley, there is a perfect information about the product quality as it can be identified before the consumption by its freshness, appearance; (*2) experience goods*, like canned food, the quality of the product can be noticed after the consumption; *(3) credence goods*, like organic foods, dolphin-safe tuna, free-range meat, and kosher foods, the product quality cannot be directly determined by consumers during the consumption and even after the consumption. Likewise, Giannakas (2002), McCluskey (2000), Hobbs (2004) and Nestorowicz (2014) explain that organic food products can be categorized as credence goods, and the information in this market is asymmetric. McCluskey (2000) also adds that by the credence-good nature of organic products, a profit-maximizing producer is able to earn more from deceiving consumers with false quality claims.

Several studies examine the asymmetric information problem in food sector by highlighting that food quality, safety, price are main subjects in this issue within the supply chain (Cooper and Ross, 1985; Mc Cluskey, 2000; Hobbs, 2004; Starbird and Amanor-Boadu, 2007). Laffont and Tirole (1993) express that contract design in agro environment scheme payments, chains and food quality have become an important tool as a solution for asymmetric information. According to Bogetoft and Ballebye (2004), contracts lead optimal production in the supply chain, and brings income and market stability from producers' side. Worley and Mc Cluskey (2000) examine adverse selection in food quality, propose a principal-agent model to design proper contracts in wheat market. In food safety, Starbird and Amanor-Boadu (2007) also proposes contract to solve adverse selection, and designs a principal-agent model to differ unsafe and safe producers in accordance with the contamination level.

Hennessy (1996) points out that the vertical integration may be a way to solve asymmetric information problem in terms of food safety. Similarly, Vetter and Karantininis (2002) point out the necessity of vertical integration to solve moral hazard problem in organic food market. Minarelli et al. (2016) indicate that the vertical integration makes possible to guarantee the food attributes that are problematic to reduce testing costs; however, they also highlight that this approach is not widely applied in practice.

Traceability is another solution for asymmetric information problem. At the presence of asymmetric information within the supply chain in food sector regulatory precautions and traceability are measures to protect consumer. In food safety and quality, Hobbs (2004) represents a game tree model to test the effects of ex post and ex ante traceability systems. The model shows that ex ante traceability system is effective with a third party monitoring system in food quality; and ex post certification with government implementation is essential for food quality. Ippolito (2003) expresses organic standards as "credible mechanisms" to sustain high quality of organic food for consumers.

4.2.2. Product Differentiation

A product has several characteristics to attract consumers. Product differentiation provides a greater variety of products for consumers, generates a competitive market structure, brings new products into the market and enhances the economic progress and it exists when a product is charged at higher price and consumers are more willing to pay for it than the other (Holcombe, 2009).

Organic production is in line with organic principles; and it is differed from the conventional systems since it aims to enhance environment, health, sustainability, animal welfare. Siderer et al (2005) express that consumers have lost their trust in conventionally grown food products due to crises like mad cow disease, foot-and-mouth epidemic, Belgian dioxin scandal; health concerns with regard to pesticide residues and antibiotic use in livestock production. Consumer mistrust leads consumers to demand organic food products. Carlson and Jaenicke (2016) clarify that product differentiation occurs when consumers and producers agree with the difference between organic and non-organic products. They add that organic certification process and labels differ organic production from conventional. McCoy and Parlevliet (2000) indicate that the commodities that have additional differentiation in terms of better taste or other qualities can compete with conventional products; thus organic products' difference can be an effective promotion point in competition with conventionally grown produces.

Since the asymmetric information is a crucial problem in the organic food supply and demand, there are several cases showing the importance of fraud and its effect on market efficiency. IFOAM (2008) explains that fraud cannot be completely prevented in the organic market; certification procedures have an impact to detect and minimize the risk of fraudulent actions. Announced and unannounced inspections by the control and certification bodies and implementation of third parties' higher standards – in comparison with national legislations-, legal sanctions, decertification penalty are precautionary actions to mitigate the risk of mislabeling. As mentioned in earlier chapters, marketing products under the names that have closer meanings to "organic" cause misperception of consumers. IFOAM (2008) express that conventional products named as "farm fresh …", "produced naturally", "integrated production", "extensive cultivation", "eco-friendly" may take the advantage of organic agriculture's positive image and it may mislead consumers. Moreover, Colom-Gorgues (2009) points out the fraudulent use of the term "bio" as it can mislead organic consumers in Spain.

The fraudulent actions have been occurred during the production process. Lo and Matthews (2002) report the fraudulent use of synthesized agricultural inputs in organic food products. As Allen and Kovach (2000) express, some organic growers use chemical inputs such as methyl bromide to fumigate the land and then use organic production methods for perennial crop plantation like apples, grapes on the lands during the conversion period. Similarly, use of organochlorine pesticide were found in organically grown tomatoes as Gonzalez et al. (2003) express.

From another point of view, the report of EUROPOL and EUIPO (2017) explains that there have been fraudulent cases in organic food market regarding the misuse of "organic" labels. The report indicates that such products do not have required organic certification and marketed as "organic" in order to capture higher organic premium prices. Besides, in US import, a major organic grain exporter from Turkey has violated federal organic regulations, as a result their certification has been revoked. Against this fraudulent action, authorized bodies have developed a best practice guide in order to prevent the fraud in the organic market (FIBL and IFOAM, 2018). Also, USDA Report (2016c) Turkish organic food market implies the existence of reports from respectable institutions such as FIBL, Eurofins Scientific the Cornucopia Institute and the French Ministry of the Economy that indicated some

fraudulent cases in terms of unapproved production methods in the organic food products from Turkey. This report also expresses some fraudulent cases in terms of false organic certificates of some Turkish firms.

4.3.MODEL SETUP

Referring the literature, we assume that organic products are credence goods as their characteristics are not observable even after the consumption. Moreover, while there is perfect substitutability with conventional food products, organic goods are differentiated objectively (there is a different environment friendly production process) and subjectively (consumers value organic products differently attributing health and life style benefits); this in turn gives these value added. The producer or seller of organic food has to give additional information on the organic aspect of the product. This is done through labeling and certification. Consumers have different level of information on issues like health, environment, sustainability, presence of alternative products. There is heterogeneity in terms of information level. More informed consumers would be able to differentiate organic food from conventional as know the certification institutions while the less informed only read the labels and if it is written organic, they believe so. The objective differentiation would be captured fully by informed consumers and organic food market will be dominated by asymmetric information. Consumers are also heterogeneous in the relative importance of the value added organic food. Some are more concerned about environment, sustainability and others care less. Figure 4.3 represents this two dimensional differentiation in the demand for organic good. Generally, in models of product differentiation, spatial competition is one-dimensional. The firms compete by locating on one dimension and choosing prices. In the context of organic demand, we have two-dimensional differentiation of the demand. These two consumer characteristics are specified as horizontal and vertical dimensions. On the horizontal axis, consumers are differentiated with the subjective value they attribute to organic food and vertically, they are differentiated in terms of information they possess.

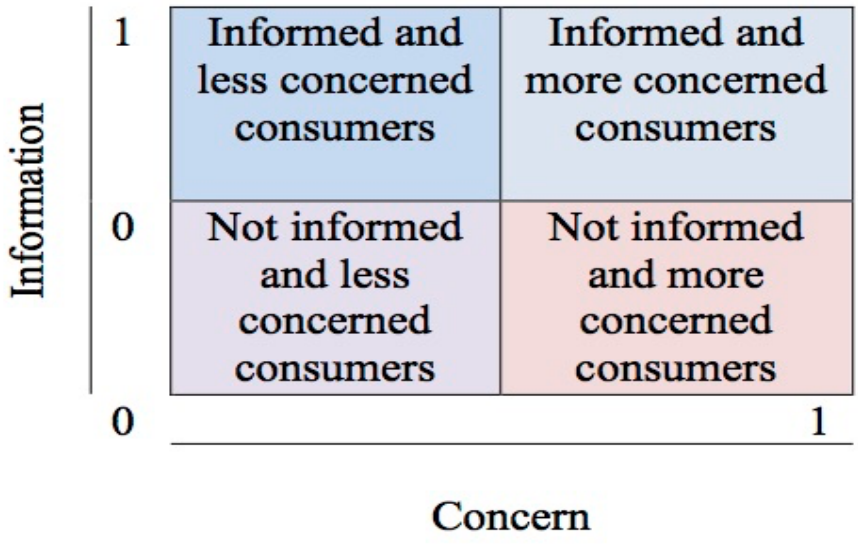

Figure 4.3 The Organic Food Consumer Types

We assume that consumers are either informed or not. Consumer i is located on the unit interval in terms of his subjective valuation $\sigma_i \in [0,1]$ and is differentiated in terms of his information on organic certification; a share θ of consumers are informed and the rest are not. We suppose that the distributions of consumers in terms of their concern and information levels are independent and the distribution of consumers in terms their information level is uniform thus each consumer will be informed with probability θ. Consumers are supposed to have utility f from consuming food while consuming organic food gives additional utility $\sigma_i v$ given the type of the consumer. Thus, the utility of the consumer i consuming organic food may be expressed as:

$$u_{i,o} = f + \sigma_i v - p_o \qquad (1)$$

and the utility of the consumer i consuming conventional food is:

$$u_{i,c} = f - p_c \qquad (2)$$

where p_o and p_c are prices of organic and conventional food respectively. The informed consumers will definitely pick the certified organic food when they choose the organic

option while the uninformed consumers will be also attracted by mislabeled products. For the consumers who is indifferent between consuming organic and conventional food, these utilities will be equal; $u_{s,o}= f + \sigma_s\, v - p_o= f - p_c= u_{s,c}$. Thus, up to σ_s, consumers will prefer conventional food and the rest will prefer organic food $(1-\sigma_s)$ where $\sigma_s=\frac{p_o-p_c}{v}$. The production of organic food has higher costs than conventional alternatives including fixed costs such as certification cost, and unit costs due to its labor intensive structure and the necessity to use organic agricultural inputs. In terms of costs, food market is a heterogeneous market. We suppose that the total cost associated with the production of organic food is $TC_o(q_o) = F + \mu_o\, q_o$ and the cost of conventional food production is $TC_c(q_c) = \mu_c\, q_c$ where $\mu_c < \mu_o$. We suppose that the organic food market is affected by moral hazard issues as some conventional producers mislabel their products; this may be due to the ignorance of some agricultural producers or to unethical behavior with a share α of producers applying mislabeling. The demand for conventional food is $d_c=\sigma_s$, whereas for the demand for organic food, we have to calculate two separate demands because there will be consumers willing to buy organic food and as they are uninformed, they choose mislabeled products when they encounter those. As with probability θ, each consumer is informed, the probability that we have an uninformed consumer buying a mislabeled product is $\theta\alpha$. The demand for correctly labelled organic food is $d_o= (1-\theta\alpha)\ (1-\sigma_s)$, whereas the demand for mislabeled products is $d_{co}= \theta\alpha\ (1-\sigma_s)$ and the utility of the consumer i consuming mislabeled conventional food is:

$$u_{i,co}= f - p_o \qquad (3)$$

Thus the profit of the organic producer is:

$$\Pi_o = p_o\, d_o - TC_o(q_o) \qquad (4)$$

The profit of the producer of conventional food is:

$$\Pi_c = p_c\, d_c - TC_c(q_c) \qquad (5)$$

and the profit of the producer of conventional food mislabeling its product as organic is:

$$\Pi_{co} = p_o\, d_{co} - TC_c(q_c) \qquad (6)$$

where d_o, d_c and d_{co} are the demand for correctly labelled organic, conventional and mislabeled food respectively. While organic and conventional producers maximize profit, mislabeling producers will take the organic food prices as given. We suppose that producers compete by choosing their prices, thus the first order conditions for the organic and conventional producers are:

$$\frac{\delta \Pi_o}{\delta p_o} = d_o + p_o \frac{\delta d_o}{\delta p_o} - \mu_o \frac{\delta d_o}{\delta p_o} = (1-\theta\alpha)\left(1 - \frac{p_o - p_c}{v}\right) + \frac{(1-\theta\alpha)(\mu_o - p_o)}{v} = 0$$

$$\frac{\delta \Pi_c}{\delta p_c} = d_c + p_c \frac{\delta d_c}{\delta p_c} - \mu_c \frac{\delta d_c}{\delta p_c} = \frac{p_o - p_c}{v} + \frac{\mu_c - p_c}{v} = 0$$

The best response functions are:

$$R_o(p_c) = \frac{v}{2} + \frac{p_c}{2} + \frac{\mu_o}{2}$$

$$R_c(p_o) = \frac{p_o}{2} + \frac{\mu_c}{2}$$

Let the Nash equilibrium of this price competition be the pair (p_o^*, p_c^*). The resulting equilibrium prices and demand for conventional food are:

$$p_o^* = \frac{2v}{3} + \frac{\mu_c}{3} + \frac{2\,\mu_o}{3}$$

$$p_c^* = \frac{v}{3} + \frac{2\mu_c}{3} + \frac{\mu_o}{3}$$

$$\sigma_s^* = \frac{v - \mu_c + \mu_o}{3v}$$

The equilibrium profits are[1]:

$$\Pi_o^* = (1-\theta\alpha)\,(1-\sigma_s^*)\,(p_o^* - \mu_o) - F \qquad (7)$$

$$\Pi_c^* = (1-\alpha)\,\sigma_s^*\,(p_c^* - \mu_c) \qquad (8)$$

and the profit of the producer of conventional food mislabeling its product as organic is:

$$\Pi_{co}^* = \alpha\theta\alpha\,(1-\sigma_s^*)\,(p_o^* - \mu_c) \qquad (9)$$

We can conceive the formation of organic food market as a dynamic game where at the first period, firms consider whether to enter the organic food market and at the second period they compete in prices in a differentiated market. Then as the proposition shows the information level in the society creating moral hazard problems is a barrier for entry.

Proposition 1. In equilibrium, we must have $\Pi_o^* \geq \Pi_c^*$ for the organic market to exist in the first place. $(1-\theta\alpha)\,(1-\sigma_s^*)\,(p_o^* - \mu_o) - F \geq (1-\alpha)\,\sigma_s^*\,(p_c^* - \mu_c)$ which implies $F \leq (1-\theta\alpha)\,(1-\sigma_s^*)\,(p_o^* - \mu_o) - (1-\alpha)\,\sigma_s^*\,(p_c^* - \mu_c)$. The increase in $\theta\alpha$, the probability with which an uninformed consumer buys a mislabeled good, the size of the moral hazard problem endangers the profitability of the organic food production.

[1] *In equilibrium, the profit of the conventional producer must be non-negative for the existence of the food market ie.* $p_c^* - \mu_c \geq 0$. *This implies that* $\frac{v}{3} + \frac{2\mu_c}{3} + \frac{\mu_o}{3} - \mu_c \geq 0$ *and* $v \geq \mu_o - \mu_c$.

The asymmetric information causes an entry barrier to the organic food sector even if the fixed costs are covered by the revenues, the profit of organic producers shall be greater than or equal to the profit of conventional ones. If the mislabeling increases, organic food producers may never appear.

Proposition 2. Information level of consumers $\theta\alpha$ does not affect p_o and p_c, whereas it affects Π_o^*.

To sustain higher profits for organic producers and avoid market failure, policies with regard to amelioration of consumer information on organic products must be implemented. Public introduction of correct organic labelling and certification may prevent this problem in the first place. The total utility of all consumers in equilibrium is:

$$CS^* = \sigma_s^*(f - p_c^*) + \theta\alpha(1-\sigma_s^*)(f - p_o^*) + (1-\theta\alpha)(1-\sigma_s^*)(f - p_o^*) + (1-\theta\alpha)\int_{\sigma_s^*}^{1} v\sigma_i \, d\sigma_i$$

$$CS^* = f - \sigma_s^* p_c^* - (1-\sigma_s^*)p_o^* + (1-\sigma_s^*)(1-\theta\alpha)\frac{v}{2}(1+\sigma_s^*)$$

Proposition 3. An increase in the probability $\theta\alpha$ decreases the surplus of consumers CS^*. Welfare of consumers who consume mislabeled products decreases and total welfare decreases with the moral hazard. For this reason, policy requirements, intervening the entrance of mislabeling producers in the sector and guaranteeing that the organic authenticity of products are sustained and secured are crucial to protect consumers even if there is no entry barrier to the market. The welfare in equilibrium is:

$$W^* = CS^* + \Pi_o^* + (1-\alpha)\,\Pi_c^* + \alpha\Pi_{co}^* \qquad (10)$$

$$W^* = f - \sigma_s^* p_c^* - (1-\sigma_s^*)p_o^* + (1-\sigma_s^*)(1-\theta\alpha)\frac{v}{2}(1+\sigma_s^*)$$

$$+ (1-\theta\alpha)\,(1-\sigma_s^*)\,(p_o^* - \mu_o) - F + (1-\alpha)\,\sigma_s^*(p_c^* - \mu_c)$$

$$+ \alpha\theta\alpha(1-\sigma_s^*)\,(p_o^* - \mu_c)$$

When we look at the welfare, we see that on consumer side, there is the basic utility from consuming food and the additional benefit of organic for those who are not fooled and on producer side there is a gain by mislabeling producers from not having to pay the additional unit cost of producing organic food. The loss is associated with the fixed cost of entering the organic food market and the unit costs of producing organic and conventional food. The change in equilibrium welfare for a given change in θ and α is:

$$\frac{\delta W^*}{\delta \alpha} = -(1-\sigma_s^*)\theta\frac{v}{2}(1+\sigma_s^*) - \theta(1-\sigma_s^*)(p_o^* - \mu_o) - \sigma_s^*(p_c^* - \mu_c) + 2\theta\alpha(1-\sigma_s^*)(p_o^* - \mu_c)$$

$$\frac{\delta W^*}{\delta \theta} = -\alpha(1-\sigma_s^*)\frac{v}{2}(1+\sigma_s^*) - \alpha(1-\sigma_s^*)(p_o^* - \mu_o) + \alpha^2(1-\sigma_s^*)(p_o^* - \mu_c)$$

Proposition 4. Information problems on the consumer side θ affects negatively the welfare in the market ($\frac{\delta W^*}{\delta \theta} \leq 0$, when the share of informed consumers increases ie. θ decreases, the overall welfare increases). When $\alpha = 0$, we have

$$\frac{\delta W^*}{\delta \alpha} = (1-\sigma_s^*)\left(-\theta\frac{v}{2}(1+\sigma_s^*) - \theta(p_o^* - \mu_o)\right) - \sigma_s^*(p_c^* - \mu_c) \leq 0$$

and when $\alpha = 1$, we have

$$\frac{\delta W^*}{\delta \alpha} = (1-\sigma_s^*)\left(-\theta\frac{v}{2}((1+\sigma_s^*) - \theta(p_o^* - \mu_o) + 2\theta(p_o^* - \mu_c)\right) - \sigma_s^*(p_c^* - \mu_c) \leq 0,$$

then as the welfare is linear in α, by intermediate value theorem, $\frac{\delta W^*}{\delta \alpha} \leq 0$, when the share of mislabeling companies increases ie. α increases, the overall welfare decreases. The reason is that the benefit of mislabeling is small compared with the loss it creates in the market. The lack of information creates a negative externality in the market. The lack of information on consumer side and the resulting moral hazard on producer side decreases the welfare in the market. We can consider two types of policies: aiming at

the education of consumers on organic production and labelling (decrease θ) or the control and audit of the market (decrease α) will definitely improve welfare.

4.4.CONCLUSION

In this chapter we aimed to analyze the impacts of consumers' information and concern levels and fraudulent actions like mislabeling conventional products as "organic" in the organic food sector. With regard to literature and our earlier findings, we have constructed a consumer profile including information and concerns of consumers. As claimed earlier, organic food products have a credence nature, information like certification and labels signal consumers to purchase organic food products. As differentiated goods, organic food products attract consumers with different motives and concerns. Since the existence of fraudulent act in terms of false organic labels and certifications cause a threat for the market efficiency in reality, we have included mislabeling producers into our model to analyze their impact on welfare.

The asymmetric information creates a negative externality in the organic food market. The lack of information of consumers only benefits the mislabeling, unethical producers. The model shows that the lack of information of consumers lead the lack of utility from consuming organic food while they are charged organic food prices. On the one hand, it is seen that the prices are not affected by the parameters related to the lack of information and mislabeling and thus the market price for organic food remains low and may even remain behind a sufficient level for the entry to the market. On the other hand, we see that these parameters affect producers' profits. Since the moral hazard problem occurs, the mislabeling producers will be more willing to enter the market and this situation may discourage organic producers to enter or stay.

The lack of information on consumer side and the resulting moral hazard on producer side decreases the welfare in the market. To prevent this, policies either aiming at the education of consumers on organic production and labelling or the control and audit of the market may definitely improve the welfare. In terms of

education, government may implement a more efficient policy in broadcasting of organic products e.g. what are the requirements in the labelling of an organically produce and how to recognize. Since our results from Chapter 2 propose the impact of social media as the source of information, government agencies may also broadcast informative briefs on social media. Also, an effective collaboration between NGOs and government may increase the level of information in the consumer side. NGOs – since they contribute the expand of organic bazaars in the country- may contribute to inform consumers. Establishing cooperation of certified organic producers may also direct consumers for purchasing correctly labeled organic products. In terms of auditing, policies including dissuasive penalties e.g. decertification may be implemented to prevent the entry of mislabeling producers in the market. Since the EU will include decertification of producers with false claims in the market, a similar approach may be useful. Also, the numbers of controls may be increased and unannounced inspections may diminish the moral hazard problem. In terms of the use of similar words to "organic" like natural, from farm, free-range, without GMOs; government must clarify the distinction between these products and organic authenticity through label requirements, broadcasting.

5.CONCLUSION

Organic agriculture and food market have become a mainstream industry worldwide. Retail sales in the market have reached to more than 80 Billion USD globally. There are tremendous increases in organic agricultural lands, the number of organic producers, retail sales volume and per capita consumption. Since the green consumerism, food security, concerns on health, environment, animal welfare and sustainability have aroused worldwide, consumers have started to substitute their food choices to organic alternatives.

The thesis aims to analyze the development and constraints in organic food market in Turkey. First we have a comparative analysis of organic food market in terms of policies, statistics, then we look into the demand for organic food; after we examine the organic food supply side in terms of producer profile and constraints, entry barriers in the market and finally we model the impact of mislabeling on total welfare.

The thesis firstly gives a detailed information on the creation and the development of organic agriculture regarding its definition, principles, history, benefits, advantages and disadvantages, relation with sustainability, production process, supply and demand sides. Organic agriculture and food products are healthier and more environmental-friendly alternatives for conventional system. Organic food production has aroused as a sustainable food system and attracts consumers having concerns about health, environment, nutrition. Besides its benefits and advantages, organic agriculture is mostly criticized of becoming a more corporate sector, having negative externalities such as bacterial contamination, and longer mileage. Organic production includes a conversion period in which land and all inputs are analyzed by

an authorized control and certification body. After the conversion period, annual inspections and analysis of products and soil are mandatory. In the supply of organic food, farmers' market is substantial, as it constitutes a platform where producers meet consumers; whilst indirect channel has been expanding out since retailers have been more involved in the distribution.

The study concentrates on a comparative analysis of organic agricultural, livestock, aquaculture and apicultural productions, retail sales volumes, policies and impact of institutions and NGOs in US, EU and Turkey. US and EU are the two largest organic food markets in the world. In comparison with US and EU, organic food market volume remains at lower extent in Turkey. For instance, the retail sales have reached 46.3 Billion USD in US, while it is only 90 Million USD in Turkey. In terms of organic livestock production in Turkey, the production volume and head numbers also remain behind those of the developed countries. The lack of statistics and data for organic food production and retail sales is also an important problem in the analysis of the market. Moreover, there are volatilities in the production numbers and loans provided for organic producers. Organic aquaculture production remains at a very low scale and it still requires development and investment.

In terms of organic standards, there are several standards based on national governments and international organizations. Standards that are created by international organizations are mostly more stringent in comparison with national ones. Also, we see differences between policies and standards in terms of allowance of methodology, substance and additives. In the study, US, EU and Turkish organic agriculture policies are examined separately. In general, all three legislations have similar general and specific rules for organic production, processing and marketing in terms of prohibiting GMO and artificial input use. There are small differences such as; EU organic farming act clarifies the training of personnel in organic livestock holdings in detail; US organic agriculture program (NOP) categorizes organic products into three labels in accordance with the percentage of organic content whereas Turkish and EU legislations only define organic products when they consist of 95% of organic ingredients. Turkish organic farming act was conducted in compliance with EU act and it clarifies the separation of conventional and organic products in the production

and processing more severely. Referring to new developments in EU organic farming legislation, and having eligibility to be placed in third country list, Turkey should adopt adjustments in the current organic agriculture legislation.

There are several internationally and nationally founded institutions and NGOs providing information, technical knowledge, discussion fora, statistics, publications, conferences, meetings worldwide. In US and EU, several institutes that are linked to universities conduct scientific research and publications and several NGOs promoting grant opportunities for organic producers. In Turkey there are university institutes NGOs aiming to enhance consumer information, organization of organic bazaars and markets, and collectivity of producers.

In order to analyze the demand for organic food, a consumer survey was designed and conducted to 750 participants living in Istanbul, Ankara and Izmir. The sample was selected using a stratified random sample of consumers based on quotas in terms of age, gender and city populations was applied in accordance with statistics provided by TURKSTAT (2016a, 2016b). The three largest metropoles were chosen for the sample since organic food consumption mostly takes places in urban cities referring to studies conducted in Turkey and USDA (2016c). Several questions were asked to participants, and more detailed questions to those who are organic food consumers. We aim to reveal a profile of organic food consumers with regard to consumers' general food preferences, attitudes and beliefs towards organic, health conditions and concerns, environmental awareness and knowledge, information on organic logos and as a source for organic food products, confidence on organic logos and certification, advertisement channels and confidence on food products, purchase characteristics and frequencies, motivations, signals, barriers of organic food consumption and purchase. There are two econometric models in this study. First, we examine the likelihood of being an organic food consumer in Turkey and secondly we look into segmentation of organic food consumers referring to their relative reservation prices. A binary logistic regression analysis is applied in the first econometric model and OLS estimations in the second one. To detect multicollinearity, VIF analysis and correlation matrix are also applied.

The findings show that organic food consumers are generally aged older than 30 years, married and have more likely higher income. They are more focused on health aspects in organic food consumption as they mostly do regular physical activities. Regarding the orientation towards organic consumption in terms of having certain diseases or having experienced these through a member in the family, consumers who had heart and cardio-vascular, Parkinson diseases tend to consume organic food more. In terms of the impact of diseases in the family, consumers who inherit dietary habits and have obesity in the family tend to consume less organic food, continuing the old eating patterns. In this context, any policy in promoting healthy diets and education from the elementary school in terms of having healthy dietary habits may increase the demand for organic food. Nutrition is not a determinant in the organic food consumption since consumers who find organic food nutritious are less likely to be consuming these; this may stem from the income effect as a strong income effect is detected. However, taste is a determinant and in the marketing process of organic food, it can be an important highlight. The ecological aspect has a limited impact on the organic food consumption since there are two triggers related with environmental awareness: less pollution associated with organic production and the privilege to know the country of origin when organic food is consumed. Thus, policies in the amelioration of environmental knowledge and positive externalities of organic agriculture on ecology may be effective in the growth of the demand for organic food. Policy makers, NGOs may cooperate in this context.

Organic food consumers in Turkey have information on the state organic logo as we found a positive and significant correlation between recognizing this logo and organic food consumption; however, the results show that organic food consumers are confused about the recognitions and organic representations of other logos shown. They cannot correctly answer all the logo questions and have a tendency to consider logos with labels like “GMO-free” and “natural” as organic. Besides they have a misperception of organic authenticity and no clear information to distinguish logos under the label “natural” and “organic”. In order to increase the knowledge and information on organic logos, certain policies in terms of broadcasting, informing consumers on organic food labeling, certification and strict rules to differentiate organic products from the products marketed as “natural” must be implemented. Information on organic food products may be channeled through social media since it

is a significant information source for organic products. We also found that doctor recommendation is an important information source on organic, as a result of linking a healthy diet and organic food consumption. Having doctor advice on the organic food consumption may be substantial to increase organic food awareness and consumption; however, we also believe any policy promoting doctor advice on organic food consumption may have side effects on poor population since there is a strong income effect. Tracking general food advertisements on TV and radio has a negative impact on the likelihood of being organic food consumers since there is a lack of organic food advertisements on these channels or the relatively higher frequency of advertisements for conventional food. Moreover, consumers who don't trust food advertisements are less likely to consume organic food than those trusting food advertisements. It is possible to argue that as a part of industrial system, organic agriculture also poses an original belief in the industrial production and distribution system; confusion that makes consumers to value more natural goods than organic ones mostly occurs from the same disbelief.

In the demand side study, in the second part of econometric models, a separate analysis on organic food consumers is conducted regarding their relative reservation prices for organic food products. We conclude that organic food demand is segmented into two groups of consumers; one group considers organic food as a substitute for conventional food with value added by environmental and sustainability aspects; whilst the other group with less average income perceive organic food as a tastier variety in the food market. Nutrition is a problematic aspect since both groups of consumers with nutrition concerns value organic food less and it is possible to say that the reason behind this may be the fact a nutritional alternative should not be as expensive as organic food. Moreover, marketing organic food regarding these segments may also improve the demand.

In the study of organic food supply, we conducted a producer survey to 250 food consumers in Turkey. Food producers in the sample are chosen in accordance with the member lists of commerce and industrial associations as they were more accessible. Several questions are asked to food producers and different question are also asked to organic and conventional food producers regarding constraints and entry

barriers in the sector. Regarding the methodology, we applied binary logistic regression. In the first model, we measured the profile, constraints and entry barriers in accordance with being organic food producers. Secondly, we have categorized organic producers in terms of their entry years to the sector before and after 2004 when the organic law has been registered in Turkey, firm size and product type as raw and processed. Similar to the demand side, VIF analysis and correlation matrix are applied to detect multicollinearity.

The results show that organic and conventional food producers are segregated in terms of their experience and anticipation of constraints and entry barriers in the organic food market. The study shows that organic food producers have experienced constraints on the demand side; whilst conventional food producers tend to anticipate educational aspect as an entry barrier. Policies on improving organic agricultural education may lead conventional food producers to convert to organic agriculture. The majority of the producers in the sample claimed that they do not use government incentives, and most of them have limited information on organic production. We see that organic food producers are more environment-conscious and unionized than conventional producers in Turkey. It is possible to argue that joint actions are usual among organic producers since the production is mostly concentrated on Aegean and Mediterranean regions, and there is a tendency to have group certification for organic products. Moreover, environmental awareness is an important trigger to start an organic production. Green movement and its linkage with organic agriculture can be promoted to producers in order to acquire a higher growth in the supply of organic food.

Besides, the study focuses on the comparison of organic food producers in terms of their entry year to the sector, firm size and product type is made. We see that firms face different constraints in accordance with their entry years, firm size and product type. Referring to our findings, different policies and government supports regarding firm characteristics should be implemented in order to stimulate a growth in the supply side of the market. We see that incumbent firms in the market are more unionized and they experience infrastructural problems as constraints whereas new entrants face institutional and marketing constraints. Policies including institutional

supports for new entrants and infrastructural enhancement in the market for incumbent firms may be very helpful. Large-scale organic producers are differentiated from small scale producers by their environment-consciousness, educated and trained staff and access to shopping places. Small and medium scale organic producers experience problems in employee education and knowledge. Any policy improving the education and training of the employees in small and medium scale organic firms, may be effective. There are vocational schools which have organic agriculture programs but they do not provide any license to be a controller or a technician for graduates, a proper regulation may be helpful in this context. Organic processed food producers deal with distribution and marketing constraints, whereas organic raw food producers anticipate institutional and production oriented problems. Government incentives regarding the different needs of raw and processed organic food producers may be substantial in the development of the market.

The study looks into conventional producers; based on the year 2004 when Turkish organic farming law was released; the new comers deal with a more structured organic food market in comparison with the incumbents. The new comers consider higher unit cost as entry barriers whereas incumbent firms believe the lack of employee education as an important one in the organic food market. Policies and incentives targeting new comers such as financial supports in reducing the unit cost of organic products may be effective for the conversion to organic production. Also, policies targeting the improvements in the education of employees on organic agriculture may promote incumbent conventional firms to convert to organic production.

In terms of advertisement, we see that incumbents and small/medium scaled organic producers prefer press whereas new entrants and large scaled organic producers mostly advertise at shopping places. Also, the statistics show that organic food producers sell their products mostly in supermarkets, specialty shops and through wholesale distribution. Referring to the improved selling channels of developed countries for organic food such as farmers' markets, organic shops; NGOs and government can cooperate to establish, organize and support organic bazaars, farmers' markets to attract organic food consumers and to promote the growth in the supply side.

In the study of modelling the impact of mislabeled organic products on total welfare, we constructed a mathematical model from a game theoretical approach. For the demand side of the model, consumers are supposed to be heterogeneous in terms of information level and concerns such as healthy diet, environment. Referring to the credence nature of organic food products, information e.g. certification and labels may signal and direct consumers to purchase organic food products. Organic food products attract consumers with different motives and concerns since they are differentiated goods. In the supply side of the model, we included mislabeled organic products as a part of the demand for organic food products. The existence of mislabeling in the sector causes an asymmetric information problem and such fraudulent acts may lead a threat for the market efficiency in reality.

The mathematical model in this study shows that the asymmetric information causes a negative externality in the organic food market and only the producers who are involved in mislabeling benefits from the lack of information of consumers. Also, it is seen that the lack of information of consumers lead the lack of utility from consuming organic food while consumers pay organic food prices. It is shown that parameters related to the lack of information and mislabeling do not affect the prices, and the market price for organic food remains low and may even remain behind a sufficient level for the entry to the market. However, it is also seen that these parameters affect the profits of producers. There exists a moral hazard problem and therefore the mislabeling producers will be more willing to enter the organic food market and this may cause a problem in terms of reluctance of organic producers to enter or stay in this market. In terms of the impact of mislabeling organic food products on total welfare, the moral hazard problem and the lack of consumers' information decreases the welfare. The study proposes policies either improving the education of consumers on organic production and organic labelling or the control and audit of the organic food market may definitely be a solution. A more efficient policy in broadcasting of organic products focusing on the requirements in the labelling of an organically produce may be effective. Since the impact of social media as the source of information is powerful with regard the results in the demand side study, government agencies may also broadcast informative briefs on social media. An effective collaboration between NGOs and government representatives may also have an impact on consumer information. Establishing cooperation for certified organic

producers, policies on dissuasive penalties such as decertification may prevent the existence of mislabeling producers in the market. The numbers of controls and unannounced inspections may diminish the moral hazard problem in the supply side. In terms of the use of similar words to “organic” like natural, from farm, free-range, without GMOs; government must clarify the distinction between these products and organic authenticity through label requirements, broadcasting.

The study has reached to its aim as it examined organic agriculture and food market in Turkey from a wider perspective. We see that organic food market is still developing in Turkey, consumers are more health-oriented and have limited knowledge on environmental issues. Nutritional side of organic food products are problematic and taste is an important component in organic food purchase. Policies regarding education on healthy diets, the linkage between organic agriculture, sustainability and ecology, information on organic logos, certification and organic production system, highlighting the differences between organic and natural products, auditing and dissuasive penalties against fraud may be crucial steps in the development of the demand for organic food in Turkey. It is noteworthy to say that new entrants in the supply side are evolving to be more environment oriented. Organic movement and its relation to environmentalism can be reference points to trigger producers to enter the organic food market.

Regarding the existing literature on this subject in Turkey, the study contributes a new approach in terms of profiling organic food consumers in the three largest metropoles, segmentation of organic food consumers, profiling organic food producers, suggesting different policies and incentive in terms of firm characteristics and analyzing the impact of mislabeled organic food products on total welfare. The surveys are based on statements of consumers and producers and their claims. There were limitations as the majority of the producers were reluctant to answer questions on their financial status, the production scale. Moreover, the lack of data on organic food consumption in TURKSTAT, organic food prices in the market, categorization of the use of organic agricultural subsidies directed us to conduct surveys on consumers and producers.

Future studies on this research field may be conducted on the field like NGOs influence on information level of consumers, labeling process. Behavioral and experimental economics such as discrete choice experiment modelling may be also applied. Moreover, modelling carbon tax impact on conventional agriculture and food market can be useful. The methodology used in the segmentation of the organic consumers regarding their relative reservation prices may be also applied in future studies on the food demand. Moreover, other sustainable production systems including fair trade, rainforest standards may also be studied in the future.

REFERENCES

Acs, S., Berentsen, P., & Huirne, R. (2007). Conversion to organic arable farming in The Netherlands: A dynamic linear programming analysis. *Agricultural Systems*, *94*(2), 405-415. doi:10.1016/j.agsy.2006.11.002

Aertsens, J., Verbeke, W., Mondelaers, K. and Van Huylenbroeck G. (2009), "Personal Determinants of Organic Food Consumption", *British Food Journal*, Vol. 111, No. 10, pp. 1140-1167

Aertsens, J., Mondeleras, K., Verbeke, W., Buyssee, J. and Van Huylenbroeck J. (2010), "The Influence of Subjective and Objective Knowledge on Attitude, Motivations and Consumption of Organic Food", *British Food Journal*, Vol. 113, No. 11, 2011, pp. 1353-1378

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211. doi:10.1016/0749-5978(91)90020-t

Ajzen, I. (2006). Behavioral Interventions Based on the Theory of Planned Behavior.

Retrieved from https://www.researchgate.net/publication/245582784_Behavioral_Interventions_Based_on_the_Theory_of_Planned_Behavior

Ak, İ., (2002). "Ekolojik Tarım ve Hayvancılık", *Gıda ve Yem Bilimi-Teknolojisi*, Bursa Gıda Kontrol ve Merkez araştırma Enstitüsü, Yıl 1, Sayı 2, 2002/2, pp.31-39

Akerlof, G. A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, *84*(3), 488. doi:10.2307/1879431

Akgüngör, S., Miran, B., Abay, C., Olhan, E., & Nergis, N.K. (1999). İstanbul, Ankara ve İzmir illerinde tüketicilerin çevre dostu tarım ürünlerine yönelik potansiyel talebinin tahminlenmesi, TEAE Raporu: 1999-3, No:15, Ankara.

Akgüngör, S., Miran, B., & Akbay, C. (2010). Consumer willingness to pay for organic products in urban Turkey. *Journal of International Food and Agribusiness Marketing*, 299-313.

Retrieved from https://www.tandfonline.com/doi/abs/10.1080/08974431003641455?journalCode=wifa20

Allen, P., & Kovach, M. (2000). The capitalist composition of organic: The potential of markets in fulfilling the promise of organic agriculture. *Agriculture*

and Human Values, *17*(3), 221-232. doi:10.1023/a:1007640506965Arbindra, P.R., Moon, W. and Balasubramanian, S. (2005), "Agro-biotechnology and organic food purchase in the United Kingdom", *British Food Journal*, Vol. 107 No. 2, pp. 84-97.

Armağan, G., & Özdoğan, M. (2005). Ekolojik Yumurta ve Tavuk Etinin Tüketim Eğilimleri ve Tüketici Özelliklerinin Belirlenmesi. *Hayvansal Üretim*, *46*(2), 14-21.

Baker, S., Thompson, K. E., Engelken, J., & Huntley, K. (2004). Mapping the values driving organic food choice. *European Journal of Marketing*, *38*(8), 995-1012. doi:10.1108/03090560410539131

Barnes, A. P., Vergunst, P., & Topp, K. (2009). Assessing the consumer perception of the term "organic": a citizens' jury approach. *British Food Journal*, *111*(2), 155-164. doi:10.1108/00070700910931977

Başak, H., Özcan, S., & Yılmaz, V. (2015). Manisa İli Demirci İlçesinde Organik Tarım Hakkında Üreticilerin Bilgi Düzeylerinin ve Beklentilerinin Belirlenmesi. *Türk Tarım ve Doğa Bilimleri Dergisi* , *2*(4), 324-331. Retrieved from http://dergipark.gov.tr/download/issue-file/3072

Batlogg, V., Schmid, O., & Huber, B. (2018). Processed with care? Comparing Different Organic Regulations and Standards for Major Markets. *FiBL & IFOAM – Organics International (2018): The World of Organic Agriculture. Frick and Bonn*, 165-169.

Retrieved from https://shop.fibl.org/CHde/mwdownloads/download/link/id/1093/?ref=1

Bayram, B., Yolcu, H., & Aksakal, V. (2007). Türkiye'de Organik Tarım ve Sorunları. *Atatürk Üniv. Ziraat Fak. Dergisi*, *38*(2), 203-206. Retrieved from http://dergipark.gov.tr/download/article-file/34126

Beck, A., Kahl, J., and Liebl, B. (2012), "Wissensstandsanalyse zu Verbraucherschutz und Verarbeitung ökologischer Lebensmittel" Retrieved from: <https://www.fibl.org/fileadmin/documents/shop/1582-wissensstandsanalyse.pdf>

Belsley, D. A., Kuh, E., and Welsch, R. E. (1980): *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*, New York: Wiley.

Berry, W. D., & Feldman, S. (1985). *Multiple regression in practice*.Sage University Paper Series on Quantitative Application in the Social Sciences, 07-050. Newbury Park, CA: Sage.

Bogetoft, P., & Ballebye, O. H. (2004). *Design of production contracts: Lessons from theory and agriculture*. Kbh.: Copenhagen Business School Press.

Bos, J. F., Haan, J. D., Sukkel, W., & Schils, R. L. (2014). Energy use and greenhouse gas emissions in organic and conventional farming systems in the Netherlands. *NJAS - Wageningen Journal of Life Sciences*, *68*, 61-70. doi:10.1016/j.njas.2013.12.003

Bozyiğit, S., & Kılınç Doğan, G. (2015). Türkiye'de Doğal ve Organik Ürün Üreticilerinin Yaşadığı Pazarlama Sorunları: Keşifsel Bir Araştırma. *AKÜ İİBF Dergisi*, *17*(2), 33-47. Retrieved from DOI NO 10.5578/jeas.10297

Brandt, K., & Mølgaard, J. P. (2001). Organic agriculture: does it enhance or reduce the nutritional value of plant foods? *Journal of the Science of Food and Agriculture*, *81*(9), 924-931. doi:10.1002/jsfa.903

Brécard, D. (2017). Consumer misperception of eco-labels, green market structure and welfare. *Journal of Regulatory Economics*, *51*(3), 340-364. doi:10.1007/s11149-017-9328-8

Brécard, D., & Chiroleu-Assouline, M. (2018). *Component-free strategy of firms under pressure from the NGOs*. Retrieved from French National Research Agency website:

https://www.ethz.ch/content/dam/ethz/special-interest/mtec/cer-eth/resource-econ-dam/documents/research/sured/sured-2018/93-SURED2018_Brecard_Chiroleu-Assouline.pdf

Brown, C., & Sperow, M. (2005). Examining the Cost of an All-Organic Diet. *Journal of Food Distribution Research*, *36*(1), 20-26. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.569.9200&rep=rep1&type=pdf

Browne, A.W., Harris, P.J.C., Hofny-Collins, A.H., Pasiecznic, N. and Wallace, R.R. (2000), "Organic production and ethical trade: definition, practice and links", *Food Policy*, Vol. 25, pp. 69-89.

Bugday Association for Supporting Ecological Living. (2018). %100 Ekolojik Pazarlarda Yeni Dönem - Buğday Ekolojik Yaşam Kapısı. Retrieved from http://www.bugday.org/portal/haber_detay.php?hid=8006

Burton, M., Rigby, D., & Young, T. (2003). Modelling the adoption of organic horticultural technology in the UK using Duration Analysis. *The Australian Journal of Agricultural and Resource Economics*, *47*(1), 29-54. doi:10.1111/1467-8489.00202

Buzby, J.C. and Skees, J. (1994), "Consumers want reduced exposure to pesticides in food", *Food Review*, Vol. 17 No. 2, pp. 19-22.

Byrne, P.J., Toensmeyer, U.C., German, C.L. and Muller, H.R. (1991), "Analysis of consumer attitudes toward organic produce and purchase likelihood", *Journal of Food Distribution Research*, Vol. 22, pp. 49-62.

Carlson, A., & Jaenicke, E. (2016). *Changes in Retail Organic Price Premiums from 2004 to 2010* (ERR-209). Retrieved from USDA- Economic Research Service website: https://www.ers.usda.gov/webdocs/publications/45547/59472_err209.pdf?v=0

Casey, J. W., & Holden, N. M. (2006). Greenhouse Gas Emissions from Conventional, Agri-Environmental Scheme, and Organic Irish Suckler-Beef Units. *Journal of Environment Quality*, *35*(1), 231. doi:10.2134/jeq2005.0121

Çelik S. (2013), "Who and Why Buy Organic Food: A Field Research", *Selçuk University Journal of Institute of Social Sciences*, Vol. 30, 2013, pp. 93-108

Chamberlain, D. E., Joys, A., Johnson, P. J., Norton, L., Feber, R. E., & Fuller, R. J. (2009). Does organic farming benefit farmland birds in winter? *Biology Letters*, *6*(1), 82-84. doi:10.1098/rsbl.2009.0643

Chen, M. (2007). Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. *Food Quality and Preference*, *18*(7), 1008-1021. doi:10.1016/j.foodqual.2007.04.004

Chen, J., Lobo, A. and Bruno, B.M. (2010), "Buyer behaviour of organic food in China: consumers have their say", Proceedings of the 12th Annual International Conference of the Global Business and Technology Association, Global Business and Technology Association, Nelspruit, July 5-9.

Chinnici, G., D'Amico, M., & Pecorino, B. (2002). A multivariate statistical analysis on the consumers of organic products. *British Food Journal*, *104*(3/4/5), 187-199. doi:10.1108/00070700210425651

Chryssohoidis, G. (2000), "Repercussions of consumer confusion for late differentiated products", *European Journal of Marketing*, Vol. 34 Nos. 5/6, pp. 705-22.

Colom-Gorgues, A. (2009). The Challenges of Organic Production and Marketing in Europe and Spain: Innovative Marketing for the Future With Quality and Safe Food Products. *Journal of International Food & Agribusiness Marketing*, *21*(2-3), 166-190. doi:10.1080/08974430802589675

Conklin, N. C., & Thompson, G. (1993). Product quality in organic and conventional produce: Is there a difference? *Agribusiness*, *9*(3), 295-307. doi:10.1002/1520-6297(199305)9:3<295::aid-agr2720090309>3.0.co;2-n

Constance, D., & Choi, J. Y. (2010). Overcoming the Barriers to Organic Adoption in the United States: A Look at Pragmatic Conventional Producers in Texas. *Sustainability*, *2*(1), 163-188. doi:10.3390/su2010163

Conway, G. R., & Pretty, J. N. (1992). Unwelcome Harvest: Agriculture and Pollution. *The Journal of Applied Ecology*, *29*(2), 542. doi:10.2307/2404526

Cooper, R., & Ross, T. W. (1985). Product Warranties and Double Moral Hazard. *The RAND Journal of Economics*, *16*(1), 103. doi:10.2307/2555592

CORE Organic. (2018). Core Organic. Retrieved from https://www.coreorganic.org/,

Cornfield, J. (1962), Joint dependence of risk of coronary heart disease on serum cholesterol and systolic blood pressure: A discriminant function analysis. *Federation Proceedings* 21, Supplement 11, Part 2, 58–61.

The Council of European Union. (2007). *Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC)* (2092/91).

Retrieved from Official Journal of the European Union website: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:189:0001:0023:EN:PDF

Cunningham, R. (2002), "Who is the organic consumer?", Paper presented at Growing Organic Conference, Red Deer, Edmonton, March 11-12.

Dabbert, S. (2006). Measuring and Communicating the Environmental Benefits of Organic Food Production. *cm*, *5*(1). doi:10.1094/cm-2006-0921-13-rv

Darnhofer, I., Schneeberger, W., & Freyer, B. (2005). Converting or not converting to organic farming in Austria: Farmer types and their

rationale. *Agriculture and Human Values*, *22*(1), 39-52. doi:10.1007/s10460-004-7229-9

Davies, A., Titterington, A.J. and Cochrane, C. (1995), "Who buys organic food? A profile of the purchasers of organic food in Northern Ireland", *British Food Journal*, Vol. 97, pp. 17-23.

De Buck, A., Van Rijn, I., Roling, N., & Wossink, G. (2001). Farmers' reasons for changing or not changing to more sustainable practices: An exploratory study of arable farming in the Netherlands. *The Journal of Agricultural Education and Extension*, *7*(3), 153-166. doi:10.1080/13892240108438817

Dean, M., Raats, M. M., & Shepherd, R. (2008). Moral Concerns and Consumer Choice of Fresh and Processed Organic Foods1. *Journal of Applied Social Psychology*, *38*(8), 2088-2107. doi:10.1111/j.1559-1816.2008.00382.x

Demir, H., & Polat, E. (2006). Türkiye'de Organik Tarımın Durumu, Sorunları ve Çözüm Önerileri. *Hasad Bitkisel Üretim*, (251), 66-71. Retrieved from https://www.researchgate.net/publication/291972193_TURKIYE'DE_ORGANIK_TARIMIN_DURUMU_SORUNLARI_VE_COZUM_ONERILERI

Demiryürek, K. (2004). Dünyada ve Türkiye'de organik tarım. *Harran Üniversitesi Ziraat Fakültesi Dergisi*. 8 (3/4):63-71.

Demiryürek, K., Stopes C., & Güzel, A. (2008). Organic Agriculture: The Case of Turkey. Outlook on Agriculture, 37 (4), 7-13.

Demiryürek, K. (2011). Organik Tarım Kavramı ve Organik Tarımın Dünya ve Türkiye'deki Durumu. *GOÜ, Ziraat Fakültesi Dergisi*, *28*(1), 27-36. Retrieved from http://ziraatdergi.gop.edu.tr/Makaleler/2069745255_27-36.pdf

Desai, P. & Riddlestone, S. (2002). *Bioregional Solutions for Living on One Planet*. Totnes (Devon): Green Books.

Dettmann, R. L. (2008), "Organic Produce: Who's Eating it? A Demographic Profile of Organic Produce Consumers", Economic Research Service, USDA. Paper presented at e American AgriculturaEconomics Association Annual meeting, Orlando, FL. Retrieved from https://ageconsearch.umn.edu/bitstream/6446/2/467595.pdf

Dettmann, R. L. and Dimitri, C. (2010), "Who's Buying Organic Vegetables? Demographic Characteristics of U.S. Consumers", Journal of Food Products Marketing, 16, pp. 79-91.

Devine, C.M., Connors, M., Bisogni, C.A. and Sobal, J. (1998), "Life course influences on fruit and vegetable trajectories: qualitative analysis of food choices", *Journal of Nutrition*, Vol. 30 No. 6, pp. 361-370.

DiMatteo, K. (2004). Pesticides and Organic Agriculture. *Environmental Health Perspectives*, *112*(15), a865-a865. doi:10.1289/ehp.112-a865b

DITSL. (2018). Home. Retrieved from https://www.ditsl.org/en/

Do, Q. T. (2003). *Asymmetric Information*. Retrieved from The World Bank website:

https://siteresources.worldbank.org/DEC/Resources/84797-1114437274304/Asymmetric_Info_Sep2003.pdf

Dobbs, T. L. (2006). "Challenges Facing a Second Green Revolution: Expanding the Reach of Organic Agriculture." Paper presented at the "Organic Agriculture: Innovations in Organic Marketing, Technology and Research" Symposium, Washington, DC, October 6-7. Retrieved from: http://www.plantmanagementnetwork.org/pub/cm/symposium/organics

Dovleac, L. (2016). An overview on the supply chain for European organic food market. *Bulletin of the Transilvania University of Braşov Series V: Economic Sciences*, *9*(58), 325-330. Retrieved from http://webbut.unitbv.ro/BU2016/Series%20V/BULETIN%20I/33_Dovleac.pdf

Dreezens, E., Martijn, C., Tenbült, P., Kok, G., & De Vries, N. K. (2005). Food and values: an examination of values underlying attitudes toward genetically modified- and organically grown food products. *Appetite*, *44*(1), 115-122. doi:10.1016/j.appet.2004.07.003

Egberg Mikkelsen, B. (1993). Organic Foods in Catering. *Nutrition & Food Science*, *93*(3), 24-26. doi:10.1108/eum0000000000989

Ellen, P.S. (1994), "Do we know what we need to know – objective and subjective knowledge effects on pro-ecological behaviors", *Journal of Business Research*, Vol. 30, pp. 43-52.

Emir, M. & Demiryürek, K. (2014). Avrupa Birliği ve Türkiye'deki organik tarım mevzuatındaki gelişmeler ve son yönetmeliklerin analizi. *Adnan Menderes Üniversitesi Ziraat Fakültesi Dergisi*, 11 (2): 21-28.

Er, C. (2009). *Organik tarım bakımından Türkiye'nin potansiyeli, bugünkü durumu ve geleceğI* (pp. 304-306). İstanbul: İstanbul Ticaret Odası Yayınları.

Eraslan, I., H. (2004). *Market Creation: Organic Agriculture in Turkey*. Business Strategy and the Environment Conference, Devonshire Hall, University of Leeds, UK

Ersun, N., & Arslan, K. (2011). *Türkiye'de organik tarım ve iyi tarım uygulamaları: Üretim ve pazarlama esasları*. İstanbul: İstanbul Ticaret Odası.

EUMOFA. (2017). *EU Organic Aquaculture*. Retrieved from European Commission website: https://www.eumofa.eu/eumofa-publications

Eurobarometer. (2017, February 22). Eurobarometer: Safe, sustainable, quality: citizens share their views on EU food and farming - Agriculture and rural development - European Commission.

Retrieved from https://ec.europa.eu/agriculture/survey_en

European Commission. (2010). *The EU Organic Logo*. Retrieved from https://ec.europa.eu/agriculture/organic/sites/orgfarming/files/docs/body/user_manual_logo_en.pdf

European Commission. (2016a). TRACES: TRAde Control and Expert System - Food Safety - European Commission. Retrieved from https://ec.europa.eu/food/animals/traces_en

European Commission. (2016b). New rules for electronic certification of EU organic imports - Agriculture and rural development - European Commission. Retrieved from https://ec.europa.eu/agriculture/newsroom/302_en

European Commission. (2016c). Relations with non EU countries - Organic Farming - European Commission.

Retrieved from https://ec.europa.eu/agriculture/organic/eu-policy/eu-rules-on-trade/non-eu-trading-partners_en

European Commission. (2016d). EU funding under the new CAP - Organic Farming - European Commission.

Retrieved from https://ec.europa.eu/agriculture/organic/eu-funding/eu-funding-and-the-new-cap_en

European Commission. (2017). How will we be affected? - Climate Action - European Commission.

Retrieved from https://ec.europa.eu/clima/policies/adaptation/how_en

European Commission. (2018). *European Commission - PRESS RELEASES - Press release - The new organic Regulation* (MEMO-17-4686). Retrieved from http://europa.eu/rapid/press-release_MEMO-17-4686_en.htm

European Court of Auditors. (2018). *Organic Food in the EU*. Retrieved from https://www.eca.europa.eu/Lists/ECADocuments/BP_ORGANIC_FOOD/BP_ORGANIC_FOOD_EN.pdf

EUROPOL, & EUIPO. (2017). *2017 Situation Report on Counterfeiting and Piracy in the European Union*. Retrieved from https://www.europol.europa.eu/newsroom/news/europol-%E2%80%93-euipo-2017-situation-report-counterfeiting-and-piracy-in-eu

Fairweather, J. (1999). Understanding how farmers choose between organic and conventional production: Results from New Zealand and policy implications. *Agriculture and Human Values* 16(1):51 –63.

Falguera, V., Aliguer, N. and Falguera, M. (2012), "An integrated approach to current trends in food consumption: Moving toward functional and organic food products?", *Food Control*, Vol. 26 (2012), pp. 274-281

FAO, & WHO. (1999). *FAO - Committee on Agriculture* (COAG/99/9 Rev.1). Retrieved from http://www.fao.org/docrep/meeting/X0075e.htm

FAO. (2001). *CHAPTER 4: ASSISTANCE TO DEVELOPING COUNTRIES IN ORGANIC AGRICULTURE*.

Retrieved from http://www.fao.org/docrep/004/Y1669E/y1669e0o.htm

FAO. (2004). *Report of the FAO Internal Workshop on Good Agricultural Practices* (FAO GAP Working Paper Series 4). Retrieved from http://www.fao.org/tempref/docrep/fao/010/ag855e/ag855e00.pdf

FAO/WHO (2005). Codex Alimentarius Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods. FAO, Rome; WHO, Geneva. www.fao.org.

FAO. (2011). *Global food losses and food waste – Extent, causes and prevention*. Study conducted for the International Congress "Save Food" at Interpack, Düsseldorf, Germany, 2011 Retrieved from http://www.fao.org/docrep/014/mb060e/mb060e00.pdf

FAO. (2013). *Food Losses And Waste In Turkey Country Report*. Retrieved from http://www.fao.org/3/a-au824e.pdf

FAO. (2014). *Report of the Thirty-second FAO Regional Conference for the Near East*(NERC/14/REP).

Retrieved from http://www.fao.org/docrep/meeting/030/mj875e.pdf

FAO. (2018a). Organic Agriculture: What is organic agriculture? Retrieved from http://www.fao.org/organicag/oa-faq/oa-faq1/en/

FAO. (2018b). Key facts on food loss and waste you should know! Retrieved from http://www.fao.org/save-food/resources/keyfindings/en/

FAO. (2018c). Organic Agriculture: Why is organic food more expensive than conventional food? Retrieved from http://www.fao.org/organicag/oa-faq/oa-faq5/en/

FAO. (2018d). Organic Agriculture: Research and Institutions. Retrieved from http://www.fao.org/organicag/oa-relatedlinks/links-cat/research-and-institutions/en/

FIBL. (2015). *Background to the quality of organic products*. Retrieved from http://www.fibl.org/en/themes/lebensmittelqualitaet-sicherheit/facts-about-the-quality-of-organically-produced-food.html

FIBL, & IFOAM. (2016). *Organic in Europe: Prospects and Developments 2016*. Germany: FIBL AND IFOAM. Retrieved from https://www.ifoam-eu.org/sites/default/files/ifoameu_organic_in_europe_2016.pdf

FIBL, & IFOAM. (2018). *The World of Organic Agriculture, Statistics and Emerging Trends 2018*. Germany: FIBL AND IFOAM.Retrieved from https://shop.fibl.org/CHde/mwdownloads/download/link/id/1093/?ref=1

Fotopoulos, C. and Krystallis, A. (2002), "Organic Product Avoidance: Reasons for rejection and potential buyers' identification in a countrywide survey", *British Food Journal*, Vol. 104, Iss 3/4/5, pp. 233-260

FSA. (2018). Help for Organic Farming. Retrieved from https://www.fsa.usda.gov/programs-and-services/outreach-and-education/help-for-organic-farming/index

Geen, N. and Firth, C. (2006), "The committed organic consumer", paper presented at Joint Organic Congress, Odense.

GEKA. (2017). *Muğla Organik Tarım Yatırım Raporu*. Retrieved from http://geka.gov.tr/Files/Organik%20Tar%C4%B1m%20Yat%C4%B1r%C4%B1m%20Raporu_1592017163946.pdf

Giannakas, K. (2002). Information Asymmetries and Consumption Decisions in Organic Food Product Markets. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, *50*(1), 35-50. doi:10.1111/j.1744-7976.2002.tb00380.x

Goldman, B. J., & Clancy, K. L. (1991). A survey of organic produce purchases and related attitudes of food cooperative shoppers. *American Journal of Alternative Agriculture*, *6*(02), 89. doi:10.1017/s0889189300003933

Gonzalez, M., Miglioranza, K. S., Aizpún de Moreno, J. E., & Moreno, V. J. (2003). Occurrence and Distribution of Organochlorine Pesticides (OCPs) in Tomato (Lycopersicon esculentum) Crops from Organic Production. *Journal of Agricultural and Food Chemistry*, *51*(5), 1353-1359. doi:10.1021/jf025892w

Gotschi, E., Vogel, S. and Lindenthal, T. (2007), High school students' attitudes and behaviour towards organic products: survey results from Vienna, Institute for

Sustainable Economic Development, DoE aSS, University of Natural Resources and Applied Life Sciences, Vienna

Govindasamy, R. and Italia, J. (1999), "Predicting willingness to pay a premium for organically grown fresh produce", *Journal of Food Distribution Research*, Vol. 30 No. 2, pp. 44-53

Gracia, A. and de Magistris, T. (2007), "Organic Food Product Purchase Behavior: a pilot study for urban consumers in the South of Italy", *Spanish Journal Agricultural Research 2007*, 5(4), pp. 439-451

Green, & Maynard. (2006). The employment benefits of organic farming. *Aspects of Applied Biology*, *79*, 51-55. Retrieved from http://orgprints.org/10178/1/The_employment_benefits_of_organic_farming.pdf

Greenan, K., Humphreys, P., & McIvor, R. (1997). The green initiative: improving quality and competitiveness for European SMEs. *European Business Review*, *97*(5), 208-214. doi:10.1108/09555349710179816

Grubor, A., Djokic, N. (2016), "Organic food consumer profile in the Republic of Serbia", *British Food Journal*, Vol. 118 Issue: 1, pp.164-182, Retrieved from: https://doi.org/10.1108/BFJ-06-2015-0225

Grunert, S.C. and Juhl, H.J. (1995), "Values, environmental attitudes, and buying of organic foods", *Journal of Economic Psychology*, Vol. 16, pp. 39-62.

Guthman, J. (2000). Raising organic: An agro-ecological assessment of grower practices in California. *Agriculture and Human Values*, *17*(3), 257-266. doi:10.1023/a:1007688216321

Guthman, J. (2004). *Agrarian Dreams: The Paradox of Organic Farming in California.* Berkeley, CA: University of California Press.

Hamm, U., Gronefeld, F., and Halpin, D. (2002), "Analysis of the European Market for Organic Food" *OMIaRD*, vol. 1, School of Management and Business, Aberystwyth, University of Wales.

Hamzaoui-Essoussi L. and Zahaf M. (2008a), "Decision making process of community organic food consumers, an exploratory study", *Journal of Consumer Marketing*, 25/2 (2008), pp. 95-104

Hamzaoui-Essoussi, L. & Zahaf, M., (2008b). Profiling organic food consumers: motivations, trust orientations and purchasing behavior. *Journal of International Business and Economics 8* (2), 25–39.

Hamzaoui-Essoussi, L., & Zahaf, M. (2012). The Organic Food Market: Opportunities and Challenges. *Organic Food and Agriculture - New Trends and Developments in the Social Sciences*. doi:10.5772/30155

Hansen, J. (1996). Is agricultural sustainability a useful concept? *Agricultural Systems*, *50*(2), 117-143. doi:10.1016/0308-521x(95)00011-s

Harper, G. and Makatouni, A. (2002), "Consumer perception of organic food production and farm animal welfare", *British Food Journal*, Vol. 104 No: 3/4/5, pp. 287-99.

Harris, B., Burress, D. and Eicher, S. (2000), *Demands for Local and Organic Produce: A Brief Review of the Literature*, A Report of the Kaw Valley Project for Environmentally Identified Products, Institute for Public Policy and Business Research, University of Kansas, April 2000, Report no: 254A

Hartman Group, (2002), "Hartman Organic Research Review: A Compilation of National Organic Research Conducted by the Hartman Group", Bellevue, Washington.

Hassall & Associates (1996). *The Domestic Market for Australian Organic Produce: An Update*, RIRDC Research Paper No. 96/1, RIRDC, Canberra.

Hay, J. (1989), "The consumer's perspective on organic food", *Canadian Institute of Food Science Technology Journal*, Vol. 22 No. 2, pp. 95-9.

Hennessy, D. A. (1996). Information Asymmetry as a Reason for Food Industry Vertical Integration. *American Journal of Agricultural Economics*, *78*(4), 1034. doi:10.2307/1243859

Hill, H. & Lynchehaun, F. (2002), "Organic milk: attitudes and consumption patterns", *British Food Journal*, Vol. 104 No. 7, pp. 526-42.

Hobbs, J. E. (2004). Information asymmetry and the role of traceability systems. *Agribusiness*, *20*(4), 397-415. doi:10.1002/agr.20020

Holcombe, R. G. (2009). Product Differentiation and Economic Progress. *The Quarterly Journal of Austrian Economics*, *12*(1), 17-35. Retrieved from https://mises-media.s3.amazonaws.com/qjae12_1_2.pdf?file=1&type=document

Hole, D., Perkins, A., Wilson, J., Alexander, I., Grice, P., & Evans, A. (2005). Does organic farming benefit biodiversity? *Biological Conservation*, *122*(1), 113-130. doi:10.1016/j.biocon.2004.07.018

Horowitz, J. L., & Savin, N. (2001). Binary Response Models: Logits, Probits and Semiparametrics. *Journal of Economic Perspectives*, *15*(4), 43-56. doi:10.1257/jep.15.4.43

Hosmer, D. W., & Lemeshow, S. (2013). *Applied Logistic Regression*. Hoboken: John Wiley & Sons.

House, L.O., Lusk, J.L., Jaeger, S.R., Traill, W.B., Moore, M., Valli, C., Morrow, B. &Yee, W.M.S. (2004). Objective and Subjective Knowledge: Impacts on Consumer Demand for Genetically Modified Foods in the United States and The European Union, *AgBioForum 7*, pp.113-123.

Hrabalova, A., Handlová, J. (2006). Development of support policy in EU and the Czech Republic for grassland in organic farming. In *Sixth European Summer Academy on Organic Farming abstract proceedings*. Lednice, Czech Republic.

Hughner, R. S., McDonagh, P., Prothero, A., Shultz, C. J., & Stanton, J. (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. *Journal of Consumer Behaviour*, *6*(2-3), 94-110. doi:10.1002/cb.210

Hutchins, R.K. and Greenhalg, L.A. (1997), "Organic confusion: sustaining competitive advantage", *British Food Journal*, Vol. 99 No. 9, pp. 336-8.

IFOAM. (2006) The IFOAM Basic Standards for Organic Production and Processing. Version 2005. February.

Retrieved from https://www.ifoam.bio/sites/default/files/page/files/norms_eng_v4_20090113.pdf

IFOAM. (2008). *Criticisms and Frequent Misconceptions about Organic Agriculture: The Counter-Arguments*.

Retrieved from http://infohub.ifoam.bio/sites/default/files/page/files/misconceptions_compiled.pdf

IFOAM. (2012). Turkey | IFOAM.

Retrieved from https://www.ifoam.bio/en/turkey

IFOAM. (2014). *The IFOAM NORMS for Organic Production and Processing-Version 2014*.

Retrieved from https://www.ifoam.bio/sites/default/files/ifoam_norms_version_july_2014.pdf

IFOAM. (2018a). Principles of Organic Agriculture | IFOAM. Retrieved from https://www.ifoam.bio/en/organic-landmarks/principles-organic-agriculture

IFOAM. (2018b). General Information on Organic Standards and Certification | IFOAM. Retrieved from https://www.ifoam.bio/en/general-information-organic-standards-and-certification

IFPRI. (2002). *Green Revolution: Curse or Blessing?* Retrieved from https://oregonstate.edu/instruct/css/330/three/Green.pdf

Ilter B. and Yilmaz S. B. (2016), "Understanding Determinants of Organic Food Consumption: Turkey Example", *ACTA UNIVERSITATIS DANUBIUS,* Vol. 12 no. 4, 2016

Ilyasoğlu, H., Temel, S., and Özçelik, B. (2010), "Consumer perceptions of organic foods in Turkey", *Journal of Food, Agriculture & Environment*, 8 (3&4), pp. 279-281.

Indu, R. & Jagathy, R. (2013). Marketing Practices, Perceptions and Problems of Organic Producers In KERALA. *Elk Asia Pacific Journal Of Marketing And Retail Management*, *4*(4), pp 1-9.

Ippolito, P. M. (2003). Asymmetric Information in Product Markets: Looking to Other Sectors for Institutional Approaches. *American Journal of Agricultural Economics*, *85*(3), 731-736. doi:10.1111/1467-8276.00476

Irianto, H. (2015). Consumers' Attitude and Intention towards Organic Food Purchase: An Extension of Theory of Planned Behavior in Gender Perspective. *International Journal of Management, Economic s and Social Sciences*, *4*(1), 17-31. Retrieved from https://www.researchgate.net/publication/291699033_Consumers'_Attitude_and_Intention_towards_Organic_Food_Purchase_An_Extension_of_Theory_

Işın, F., Çukur, T. & Armağan, G. (2007). Factors Affecting the Adoption of the Organic Dried Fig Agriculture System in Turkey. *Journal of Applied Sciences*, 7, 748–754.

Jackson, L. (2006). *Successful Transition to Organic Production Shows Planning Works*. Sustainable Agriculture Research and Education Program (SAREP) Newsletter, Winter/Spring (v.18 n.1).

Jamison, D. T. (2006). *Disease control priorities in developing countries*. New York ; Washington, DC: World Bank.

Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK11795/

Jeong, S., Kang, D., Lim, M., Kang, C., & Sung, H. (2010). Risk Assessment of Growth Hormones and Antimicrobial Residues in Meat. *Toxicological Research*, *26*(4), 301-313. doi:10.5487/tr.2010.26.4.301

Jolly, D. A., & Dhesi, J. (1989). Psychographic, demographic and economic factors associated with organic poultry consumption. *AGRIS*, *4*, 57-60. Retrieved from http://agris.fao.org/agris-search/search.do?recordID=US9040440

Jolly, D. A. (1991), "Differences between buyers and non-buyers of organic produce and willingness to pay organic price premiums", *Journal of Agribusiness*, Vol. 9 No. 1, pp. 97-111.

Jolly, D. A. & Norris, K. (1991), "Marketing Prospects for Organic and Pesticide-Free Produce", *American Journal of Alternative Agriculture*, Vol. 6, No. 4.

Karki, L. & Dhakal, S. (2009). Land Ownership in Nepal: Are Lower Castes Excluded? Proceedings Tropentag 2009. Retrieved from

http://www.tropentag. de/2009/proceedings/node423.html.

Karki, L., Schleenbecker, R., & Hamm, U. (2011). Factors influencing a conversion to organic farming in Nepalese tea farms. *Journal of Agriculture and Rural Development in the Tropics and Subtropics*, *112*(2), 113-123. Retrieved from https://www.jarts.info/index.php/jarts

Kaufmann, P., Stagl, S., & Franks, D. W. (2009). Simulating the diffusion of organic farming practices in two New EU Member States. *Ecological Economics*, *68*(10), 2580-2593. doi:10.1016/j.ecolecon.2009.04.001

Kenanoğlu, Z. and Karahan, Ö. (2002), "Policy Implementations for Organic Agriculture in Turkey", *British Food Journal*, Vol: 104, 3/4/5, pp. 300-318.

Kerselaers, E., De Cock, L., Lauwers, L., & Van Huylenbroeck, G. (2007). Modelling farm-level economic potential for conversion to organic farming. *Agricultural Systems*, *94*(3), 671-682. doi:10.1016/j.agsy.2007.02.007

Kilcher, L. (2007). How organic agriculture contributes to sustainable development. *University of Kassel at Witzenhausen JARTS, Supplement*, *89*, 31-49. Retrieved from http://orgprints.org/10680/1/Kilcher_2007_JARTS_SP_89.pdf

Kılıç, S., Duman, O., & Bektaş, E. (2014). Organik Ürünlerin Pazarlama Stratejileri ve Üreticiler Üzerinde Bir Alan Araştırması. *Business and Economics Research Journal*, *5*(1), 39-65. Retrieved from https://www.berjournal.com/organik-urunlerin-pazarlama-stratejileri-ve-ureticiler-uzerinde-bir-alan-arastirmasi

Kisaka-Lwayo, M. (2008). A Discriminant Analysis of Factors Associated with The Adoption Of Certified Organic Farming By Smallholder Farmers in Kwazulu-Natal, South Africa, No 52155, *2007 Second International Conference*, August 20-22, 2007, Accra, Ghana, African Association of Agricultural Economists (AAAE), Retrieved from https://EconPapers.repec.org/RePEc:ags:aaae07:52155.

Klonsky, K., & Tourte, L. (1998). Organic Agricultural Production in the United States: Debates and Directions. *American Journal of Agricultural Economics*, *80*(5), 1119. doi:10.2307/1244215

Kniss, A. R., Savage, S. D., & Jabbour, R. (2016). Commercial Crop Yields Reveal Strengths and Weaknesses for Organic Agriculture in the United States. *PLOS ONE*, *11*(8), e0161673. doi:10.1371/journal.pone.0161673

Kristiansen, P., & Merfield, C. (2006). Overview of organic agriculture. *Organic agriculture: a global perspective*, 1-23. doi:10.1079/9781845931698.0001

Krystallis, A., & Chryssohoidis, G. (2005). Consumers' willingness to pay for organic food. *British Food Journal*, *107*(5), 320-343. doi:10.1108/00070700510596901

Krystallis, A., Vassallo, M., Chryssohoidis, G., & Perrea, T. (2008). Societal and individualistic drivers as predictors of organic purchasing revealed through a portrait value questionnaire (PVQ)-based inventory. *Journal of Consumer Behaviour*, *7*(2), 164-187. doi:10.1002/cb.244

Küp, F., Sağlam, R., Yetkin, C., Tobi, I., & Uludağ, A. (2013). The Stages of Organic Agriculture Applications and The Problems Encountered in Practice. *Paper presented at 28. Ulusal Tarımsal Mekanizasyon Kongresi 4-6 Eylül KONYA 2013* (pp. 103-110).

Retrieved from: http://www.tarmek.org/bildiriler/Organik_Tarim_Uygulamalarinin_Asamalari_ve_Pratikte_Karsilasilan_Sorunlar_.pdf

Laffont, J. J., & Tirole, J. (1993). *A theory of incentives in procurement and regulation*. Cambridge, MA: MIT Press

Läpple, D. (2010). Adoption and Abandonment of Organic Farming: An Empirical Investigation of the Irish Drystock Sector. *Journal of Agricultural Economics*, *61*(3), 697-714. doi:10.1111/j.1477-9552.2010.00260.x

Lea, E. and Worsley, T. (2005), "Australians' organic food beliefs, demographics and values", *British Food Journal*, Vol. 107 No. 11, pp. 855-69.

Lin, S. A. (1976). Introduction. In *Theory and measurement of economic externalities* (pp. 1-2). New York: Acad. Pr.

Lo, M., & Matthews, D. (2002). Results of routine testing of organic food for agrochemical residues. In J. Powell (Ed.), *UK Organic Research 2002: Proceedings of the Colloquium of Organic Researchers (COR) Conference.* (pp. 61-64). Retrieved from http:www.organic.aber.ac.uk/library/testing%20organic%20food%20for%20agrochemical%20residues.pdf

Lockie, S., Lyons, K., Lawrence, G. and Mummery, K. (2002), "Eating 'green' motivations behind organic food consumption in Australia", *Sociologia Ruralis*, Vol. 42 No. 1, pp. 23-40.

Lohr, L., & Salomonson, L. (2000). Conversion subsidies for organic production: results from Sweden and lessons for the United States. *Agricultural Economics*, *22*(2), 133-146. doi:10.1016/s0169-5150(99)00045-6

Maffei, D. F., Batalha, E. Y., Landgraf, M., Schaffner, D. W., & Franco, B. D. (2016). Microbiology of organic and conventionally grown fresh produce. *Brazilian Journal of Microbiology*, *47*, 99-105. doi:10.1016/j.bjm.2016.10.006

Magkos, F., Arvaniti, F., & Zampelas, A. (2003). Organic food: nutritious food or food for thought? A review of the evidence. *International Journal of Food Sciences and Nutrition*, *54*(5), 357-371. doi:10.1080/09637480120092071

Magnusson, M. K., Arvola, A., Hursti U.K.K., Åberg, L. and Sjoden, P. O. (2001), "Attitudes towards organic foods among Swedish consumers", *British Food Journal, 103*(3), pp. 209-227.

Magnusson, M.K., Arvola, A., Hursti, U.K.K., Åberg L. and Sjoden P.O. (2003), "Choice of organic food is related to perceived consequences for human health and to environmentally friendly behavior", *Appetite*, 40(2), pp. 109-117

Magnusson, M.K. (2004), "Consumer perception of organic and genetically modified foods: health and environmental considerations", PhD thesis, Uppsala University, Uppsala

Makatouni, A., (2002), "What motivates consumers to buy organic food in the UK", *British Food Journal*, 104, 3/4/5, pp. 345-352

Markovina, J., Cacic, J., Kljusuric, J. G., and Kovacic, D. (2011), "Young consumers' perception of functional foods in Croatia", *British Food Journal*, 113, pp. 7-16.

Mayo Clinic. (2018, April 4). Are organic foods worth the price? Retrieved from https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/organic-food/art-20043880

McCluskey, J. J. (2000). A Game Theoretic Approach to Organic Foods: An Analysis of Asymmetric Information and Policy. *Agricultural and Resource Economics Review*, *29*(01), 1-9. doi:10.1017/s1068280500001386

McCoy, S., & Parlevliet, G. (2000). Export market potential for Clean & Organic Agricultural Products. *RIRDC Publication*, (00/76). Retrieved from ISBN 0 642 58106 1

McEachern, M.G. and McClean, P. (2002), "Organic purchasing motivations and attitudes: are they ethical?", *International Journal of Consumer Studies*, Vol. 26 No. 2, pp. 85-92.

McEldowney, J. (2018). *Briefing EU Legislation in Progress, Organic Farming Legislation*(614.743). Retrieved from EPRS | European Parliamentary Research Service website: http://www.europarl.europa.eu/RegData/etudes/BRIE/2018/614743/EPRS_BRI%282018%29614743_EN.pdf

Menard, S. (1995). Applied Logistic Regression Analysis: Sage University Series on Quantitative Applications in the Social Sciences. Thousand Oaks, CA: Sage.

Mie, A., Andersen, H. R., Gunnarsson, S., Kahl, J., Kesse-Guyot, E., Rembiałkowska, E., … Grandjean, P. (2017). Human health implications of organic food and organic agriculture: a comprehensive review. *Environmental Health*, *16*(1). doi:10.1186/s12940-017-0315-4

Michelsen, J., Lynggaard, K., Padel, S., & Foster, C. (2001). *Organic Farming Development and Agricultural Institutions in Europe: A Study of Six Countries*. Organic Farming in Europe: Economics and Policy, Volume 9, Stuttgart-Hohenheim. Retrieved from http://orgprints.org/8488/1/Organic_Farming_in_Europe_Volume09_Organic_Farming_Development_and_Agricultural_Institutions_in_Europe_A_Study_of_Six_Countries.pdf

Midmore, P., Padel, S., McCalman, H., Lampkin, N. H., Fowler, S., & Isherwood, J. (2001). *Attitudes towards Conversion to Organic Production Systems: a Study of Farmers in England*. Institute of Rural Studies, The University of Wales, Aberystwyth Llanbadarn Fawr Retrieved from http://orgprints.org/10817/1/Attitude_survey.pdf

Millock K., Hansen L.G., Wier M. and Morch Andersen L., (2002), "Willingness to pay for organic foods: a comparison between survey data and panel data from Denmark", 12th Annual EAERE Conference, Monterey, USA, June.

Mimura, N. (2013). Sea-level rise caused by climate change and its implications for society. *Proceedings of the Japan Academy, Series B*, *89*(7), 281-301. doi:10.2183/pjab.89.281

Minarelli, F., Galioto, F., Raggi, M. & Viaggi, D., (2016). "Modelling asymmetric information in a food supply chain within Emilia Romagna Region," 149th Seminar, October 27-28, 2016, Rennes, France 245071, European Association of Agricultural Economists.

Retrieved from: https://ideas.repec.org/p/ags/eaa149/245071.html

Ministry of Agriculture, Fisheries and Food, UK. (2001). *House of Commons - Agriculture - Fifth Special Report*.

Retrieved from https://publications.parliament.uk/pa/cm200001/cmselect/cmagric/410/41003.htm

Ministry of Agriculture and Forestry, Turkey. (2004). *Organic Farming Law* (5262).

Retrieved from https://www.tarim.gov.tr/Belgeler/ENG/Legislation/law_organic_farming.pdf

Ministry of Agriculture and Forestry Turkey. (2014, April 20). Ar-Ge Destek Programı. Retrieved from https://www.tarim.gov.tr/TAGEM/Menu/7/Ar-Ge-Destek-Programi

Ministry of Agriculture and Forestry. (2018a). İstatistikler. Retrieved from https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler

Ministry of Agriculture and Forestry, Turkey. (2018b). Genel Bilgiler. Retrieved from https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Genel-Bilgiler

Ministry of Agriculture and Forestry. (2018c). Yürütme-İzleme. Retrieved from https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Yurutme-Izleme

Ministry of Agriculture and Forestry. (2018d). Destekler. Retrieved from https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Destekler

Mintel (2000), "Organic Food and Drink Retailing", Market Intelligence Unit of the UK Economic Intelligence Unit, London. *Quality and Preference*, 9, pp.119 133.

Moschitz, H., Stolze, M., and Michelsen, J. (2004). "Report on the development of political institutions involved in policy elaborations in organic farming for selected European states". Further Development of Organic Farming Policy in Europe with Particular Emphasis on EU Enlargement (QLK5-2002-00917), Deliverable D7. Retrieved from http://orgprints.org/4799/1/EUCEEOFP_D7_final_report.pdf

Nardalı, S., & Gençler, F. (2011). Prospects of Turkish Organic Food Sector: Some Suggestions Improving the Market. *Annals of Dun─ârea de Jos University. Fascicle I : Economics and Applied Informatics*, *17*(1), 95-100. Retrieved from https://www.researchgate.net/publication/254404761

Nelson, P. (1970). Information and Consumer Behavior. *Journal of Political Economy*, *78*(2), 311-329. doi:10.1086/259630

Nemecek, T., Jungbluth, N., I Canals, L. M., & Schenck, R. (2016). Environmental impacts of food consumption and nutrition: where are we and what is next? *The International Journal of Life Cycle Assessment*, *21*(5), 607-620. doi:10.1007/s11367-016-1071-3

Nestorowicz, R. (2014). The Information Asymmetry and The Social Responsibility on The Food Market. *International Journal of Arts & Sciences*, CD-ROM. ISSN: 1944-6934 : 07(02):59–68 (2014)

Neter, J., Wasserman, W. & Kutner, M. H. (1989). *Applied Linear Regression Models*. Homewood, IL: Irwin.

Novikova, A. (2014). Valuation of Agricultural Externalities: Analysis of Alternative Methods. *Research for Rural Development*, *2*, 199-206. Retrieved from http://llufb.llu.lv/conference/Research-for-Rural-Development/2014/LatviaResearchRuralDevel20th_volume2-199-206.pdf

Oberholtzer, L., Dimitri, C., and Greene, C. (2005). Price premiums hold on as U.S. organic produce market expands. Technical Report VGS-308-01, Economic Research Service United States Department of Agriculture (USDA)

O'brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity*, *41*(5), 673-690. doi:10.1007/s11135-006-9018-6

O'Connell, A. A. (2010). Introduction. In *Logistic regression models for ordinal response variables*. Sage University Series on Quantitative Applications in the Social Sciences. Thousand Oaks, CA: Sage.

O'Donovan, P. and McCarthy, M. (2002), "Irish consumer preference for organic meat", *British Food Journal*, 104(3/4/5), pp. 353–370.

OECD Statistics Directorate. (2001). OECD Glossary of Statistical Terms - Polluter-pays-principle Definition. Retrieved from https://stats.oecd.org/glossary/detail.asp?ID=2074

Offermann, F., Nieberg, H., & Zander, K. (2009). Dependency of organic farms on direct payments in selected EU member states: Today and tomorrow. *Food Policy*, *34*(3), 273-279. doi:10.1016/j.foodpol.2009.03.002

Official Gazette, Turkey. (2017, September 20). *Başbakanlık Mevzuatı Geliştirme ve Yayın Genel Müdürlüğü* (2017/10465). Retrieved from http://www.resmigazete.gov.tr/eskiler/2017/08/20170818M1-27.pdf

Official Journal of The European Union. (2007). Council Regulation (EC) No 834/2007. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007R0834&from=EN

Official Journal of the European Communities. (1987). *Single European Act* (L 169). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1987:169:FULL&from=EN

Olioso, B. (2008). What does organic mean? A look at the origins and organic cosmetics today. Retrieved, from Ezine Articles: http://ezinearticles.com

Oraman, Y. (2014). An Analytic Study of Organic Food Industry as Part of Healthy Eating Habit in Turkey: Market Growth, Challenges and Prospects. *Procedia - Social and Behavioral Sciences*, *150*, 1030-1039. doi:10.1016/j.sbspro.2014.09.115

OTA. (2017). *U.S. Organic Trade Data: 2011 to 2016*. Retrieved from https://ota.com/sites/default/files/indexed_files/OTATradeReport.pdf

Ott, S. L. (1990), "Supermarket Shoppers Pesticide Concerns and Willingness to Purchase Certified Pesticide-Residue-Free Fresh Produce", *Agribusiness*, 6(6), pp. 593-602.

Özen, N., Şayan, A., Ak, I., Yurtman, I. Y., & Polat, M. (2009). Hayvansal Üretim-Çevre İlişkileri ve Organik Hayvancılık. Retrieved from http://www.zmo.org.tr/resimler/ekler/e98410c45ea98ad_ek.pdf

Padel, S. & Lampkin, N. (1994). Conversion to Organic Farming: An Overview. In The Economics of Organic Farming: An International Perspective. N. Lampkin and S. Padel (eds). Wallingford, CAB International: 295-313.

Padel, S. (2001). Conversion to Organic Farming: A Typical Example of the Diffusion of an Innovation? *Sociologia Ruralis*, *41*(1), 40-61. doi:10.1111/1467-9523.00169

Padel, S. & Foster, C. (2005), "Exploring the gap between attitudes and behaviour, Understanding why consumers or do not buy organic food", *British Food Journal*, Vol. 107, No. 8, pp. 606-625

Paul, J. and Rana, J. (2012), "Consumer behavior and purchase intention for organic food", *Journal of Consumer Marketing*, Volume 29, Number 6, 2012, pp. 412-422

Potts, J., Wilkings, A., Lynch, M. & McFatridge, S. (Eds.) (2016): State of Sustainability Initiatives Review: Standards and The Blue Economy. International Institute for Sustainable Development, Manitoba, Canada. Retrieved from http://www.iisd.org/ssi/standards-and-the-blue- economy/

Powers, D.A. & Xie, Y. (2000). *Statistical Methods for Categorical Data Analysis*. San Diego, CA: Academic Press.

Pretty, J., Brett, C., Gee, D., Hine, R., Mason, C., Morison, J. I. L., Raven, H., Rayment, M. & Van der Bijl, G. (2000). An assessment of the total external costs of UK agriculture. *Agricultural Systems*, *65*(2), 113-136. doi:10.1016/s0308-521x(00)00031-7

Pretty, J., Brett, C., Gee, D., Hine, R., Mason, C., Morison, J. I.L., Rayment, M., van der Bijl, G. & Dobbs, T. (2001). Policy Challenges and Priorities for Internalizing the Externalities of Modern Agriculture. *Journal of Environmental Planning and Management*, *44*(2), 263-283. doi:10.1080/09640560120033740

Rahmann, G. (2011). Biodiversity and Organic Farming: What do we know? *Agriculture and Forestry Research*, *3*(61), 189-208. Retrieved from http://www.fao.org/fileadmin/user_upload/suistainability/pdf/11_11_28_OA_biodiversity_Rahmann.pdf

Reicks, M., Splett, P. and Fishman, A. (1997), "Shelf labeling of organic foods: effects on customer perceptions and sales", Working Paper No. 97-03, The Retail Food Industry Center, University of Minnesota, St Paul, MN.

Rehber, E. (2011). *Organik tarım ekonomisi*. Bursa: Ekin Yayınevi.

Rehber, E., & Grega, L. (2008). Agriculture, Trade and Sustainability. *The European Legacy*, *13*(4), 463-479. doi:10.1080/10848770802180755

Rigby, D., & Cáceres, D. (2001). Organic farming and the sustainability of agricultural systems. *Agricultural Systems*, *68*(1), 21-40. doi:10.1016/s0308-521x(00)00060-3

Rodale Institute. (n.d.). Mission and History. Retrieved from http://rodaleinstitute.org/about-us/mission-and-history

Roddy, G., Cowan, C. and Hutchinson, G. (1996), "Consumer attitudes and behaviour to organic foods in Ireland", *Journal of International Consumer Marketing*, Vol. 9 No. 2, pp. 1-19.

Roderick, S., Henriksen, B., Trujillo, R. G., Bestman, M., & Walkenhorst, M. (2006). The diversity of organic livestock systems in Europe. *Animal health and welfare in organic agriculture*, 29-56. doi:10.1079/9780851996684.0029

Rodriguez, E., Lacaze, V. and Lupin, B. (2008), "Valuation of consumers' willingness-to-pay for organic food in Argentina", paper presented at 12th Congress of the European Association of Agricultural Economists – EAAE, Ghent.

Rokeach, M. (1973). *The nature of human values*. New York: Macmillan.

Rosso Grossmann, M. (2007). Agriculture and the Polluter Pays Principle. *Electronic Journal of Comparative Law*, *11*(3), 1-66. Retrieved from https://www.ejcl.org/113/article113-15.pdf

Rundgren, G. (1998). *Building trust in organics: A guide to setting up organic certification programmes*. Tholey-Theley, Germany: IFOAM.

Saba, A., & Messina, F. (2003). Attitudes towards organic foods and risk/benefit perception associated with pesticides. *Food Quality and Preference*, *14*(8), 637-645. doi:10.1016/s0950-3293(02)00188-x

Salihoğlu, G., Salihoğlu, N. K., Uçaroğlu, S., & Banar, M. (2018). Food loss and waste management in Turkey. *Bioresource Technology*, *248*, 88-99. doi:10.1016/j.biortech.2017.06.083

Sanders, J., & Richter, T. (2003). Impact of sociodemographic factors on consumption patterns and buying motives with respect to organic dairy products in Switzerland. In *Socio-economic aspects of animal health and food safety in organic farming systems 1st SAFO Workshop, Florence, Italy*. SAFO, (pp. 211-218). Retrieved from http://orgprints.org/2736/1/sanders-2003-impact-of-socio-demographic-factors.pdf

Santacoloma, P. (2005). *Costs and Managerial Skills in Organic Certified Products*. Retrieved from FAO website: http://www.fao.org/docs/eims/upload/229934/2005_12_doc10.pdf

Sarıkaya, N. (2007), "Organik Ürün Tüketimini Etkileyen Faktörler ve Tutumlar Üzerine Bir Saha Çalışması", *Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü Dergisi* (14) 2007 /2, pp. 110-125

Sarker, A. & Itohara, Y. (2008). Factors Influencing the Extent of Practice of Organic Farming Technologies: A Case Study of Tangail District in Bangladesh. *American Journal of Agricultural and Biological Sciences,* 3, 584–590.

Sarker, M. A., Itohara, Y., & Hoque, M. (2010). Determinants of adoption decisions: The case of organic farming (OF) in Bangladesh. *Extension Farming Systems Journal*, *5*(2), 39-46. Retrieved from https://pdfs.semanticscholar.org/3206/712f07243721fa5d65c3a7e7f681aca9a0db.pdf

Schleenbecker, R., & Hamm, U. (2013). Consumers' perception of organic product characteristics. A review. *Appetite*, *71*, 420-429. doi:10.1016/j.appet.2013.08.020

Schneeberger, W., Darnhofer, I., & Eder, M. (2002). Barriers to the adoption of organic farming by cash-crop producers in Austria. *Soil Use and Management*, *17*(1), 24-31. doi:10.1079/ajaa200207

Schwartz, S. H. (1992). Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries. *Advances in Experimental Social Psychology*, 1-65. doi:10.1016/s0065-2601(08)60281-6

Schwartz, S. H. (2006). Basic Human Values: Theory, Measurement, and Applications. *Revue française de sociologie*, *47*(4). Retrieved from https://www.researchgate.net/file.PostFileLoader.html?id=54e6cceacf57d730228b4630&assetKey=AS%3A273707468034053%401442268353664

Scialabba, N. E., & Müller-Lindenlauf, M. (2010). Organic agriculture and climate change. *Renewable Agriculture and Food Systems*, *25*(02), 158-169. doi:10.1017/s1742170510000116

Scialabba, N. (2015). *Training Manual for Organic Agriculture*.

Retrieved from FAO website: http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/Compilation_techniques_organic_agriculture_rev.pdf

Siderer, Y., Maquet, A., & Anklam, E. (2005). Need for research to support consumer confidence in the growing organic food market. *Trends in Food Science & Technology*, *16*(8), 332-343. doi:10.1016/j.tifs.2005.02.001

Shi-ming, S. M., & Sauerborn, S. J. (2006). Review of History and Recent Development of Organic Farming Worldwide. *Agricultural Sciences in China*, *5*(3), 169-178. doi:10.1016/s1671-2927(06)60035-7

Skulskis, V., & Girgždienė, V. (2013). Direct Marketing and Consumer Trust in Organic Food Products: Vilnius (Lithuania) Case. *Journal of Agricultural Science and Technology*, *3*, 272-283. Retrieved from https://www.laei.lt/x_file_download.php?pid=1574

Smith-Spangler, C., Brandeau, M. L., Hunter, G. E., Bavinger, J. C., Pearson, M., Eschbach, P. J., … Bravata, D. M. (2012). Are Organic Foods Safer or Healthier Than Conventional Alternatives? *Annals of Internal Medicine*, *157*(5), 348. doi:10.7326/0003-4819-157-5-201209040-00007

Sparks, P., & Shepherd, R. (1992). Self-Identity and the Theory of Planned Behavior: Assesing the Role of Identification with "Green Consumerism". *Social Psychology Quarterly*, *55*(4), 388. doi:10.2307/2786955

Sparling, E., Wilken, K. & McKenzie, J. (1992). "Marketing Fresh Organic Produce in Colorado Supermarkets", Final Report to the Colorado Department of Agriculture and USDA Federal State Marketing Improvement Program. Fort Collins; CO. Colorado State University Department of Agricultural and Resource Economics. March 16.

Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, *87*(3), 355. doi:10.2307/1882010

Spoolder, H. A. (2007). Animal welfare in organic farming systems. *Journal of the Science of Food and Agriculture*, *87*(15), 2741-2746. doi:10.1002/jsfa.2999

Stanford Medicine. (2012). Little evidence of health benefits from organic foods, Stanford study finds. Retrieved from https://med.stanford.edu/news/all-news/2012/09/little-evidence-of-health-benefits-from-organic-foods-study-finds.html

Starbird, S. A., & Amanor-Boadu, V. (2007). Contract Selectivity, Food Safety, and Traceability. *Journal of Agricultural & Food Industrial Organization*, *5*(1). doi:10.2202/1542-0485.1141

Stewart, J. & Gill, L. (1998). *Econometrics*, 2nd ed. London: Prentice Hall.

Stigler, G. J. (1961). The Economics of Information. *Journal of Political Economy*, *69*(3), 213-225. doi:10.1086/258464

Stiglitz, J. E., & Weiss, A. (1992). Asymmetric Information in Credit Markets and Its Implications for Macro-Economics. *Oxford Economic Papers*, *44*(4), 694-724. doi:10.1093/oxfordjournals.oep.a042071

Stobbelaar, D.J., Casimir, G., Borghuis, J., Marks, I., Meijer, L. and Zebeda, S. (2007), "Adolescents' attitudes towards organic food: a survey of 15- to 16-year old school children", *International Journal of Consumer Studies*, Vol. 31, pp. 349-56

Stock, J. H., & Watson, M. W. (2007). *Introduction to econometrics*. MA: Pearson.

Stockdale, E., Lampkin, N., Hovi, M., Keatinge, R., Lennartsson, E., Macdonald, D., … Watson, C. (2001). Agronomic and environmental implications of organic farming systems. *Advances in Agronomy*, 261-327. doi:10.1016/s0065-2113(01)70007-7

Storstad, O. and Bjorkhaug, H. (2003), "Foundations of production and consumption of organic food in Norway: common attitudes among farmers and consumers", *Agriculture and Human Values*, Vol. 20, pp. 151-63.

Strochlic, R., Sierra, L. (2007). Conventional, Mixed and "Deregistered" Organic Farmers: Entry Barriers and Reasons for Exiting Organic Production in California, California Institute for Rural Studies

Subaşı, G. (2003). Türkiye'de organik tarım, sorunları ve çözüm önerileri. *Tarım ve Mühendislik Dergisi*, *23*(9), 66-67.

Tarkiainen, A., & Sundqvist, S. (2005). Subjective norms, attitudes and intentions of Finnish consumers in buying organic food. *British Food Journal*, *107*(11), 808-822. doi:10.1108/00070700510629760

Technavio, (2016). Organic Food and Beverages Market in Europe 2016-2020. Retrieved from: <http://www.technavio.com/report/europenon-alcoholic-beverages-organic-food-and-beverages-market-europe-2016-2020>

Teisl, M. F., & Roe, B. (1998). The Economics of Labeling: An Overview of Issues for Health and Environmental Disclosure. *Agricultural and Resource Economics Review*, *27*(02), 140-150. doi:10.1017/s1068280500006468

Tetik S. (2012), "Applied Analysis of the Factors Causing Turkish Consumers to Prefer Organic Products", *UHBAB Journal*, No. 1 Vol.1, pp. 37-64

Thøgersen, J. (2007). Consumer decision making with regard to organik food products. In Vaz, M.T.D.N., Vaz, P., Nijkamp, P. & Rastoin, J.L. (Eds), *Traditional food production facing sustainability: A European challenge*, Ashgate: Farnham.

Thompson, G.D. & Kidwell, J. (1998), "Explaining the choice of organic produce: cosmetic defects, prices, and consumer preferences", *American Journal of Agricultural Economics*, 80, 2, pp. 277-87

Timmins C. (2010), "Consumer Attitudes towards Organic Food- Phase 2: Survey of the General Public", Beaufort Research

Torjusen, H., Sangstad, L., O'Doherty Jensen, K. and Kjaernes, U. (2004), "European Consumers' Conceptions of Organic Food: A Review of Available Research", National Institute for Consumer Research, Oslo, p. 147.

Tregear, A., Dent, J.B., Mcgregor, M.J. (1994), "The demand for organically grown produce", *British Food Journal*, 94(4), pp. 21-25

Tsakiridou, E., Boutsouki, C., Zotos, Y., & Mattas, K. (2008). Attitudes and behaviour towards organic products: an exploratory study. *International Journal of Retail & Distribution Management*, *36*(2), 158-175. doi:10.1108/09590550810853093

Tung, S., Tsay, J.C. & Lin, M. (2015), "Life course, diet-related identity and consumer choice of organic food in Taiwan", *British Food Journal*, Vol. 117 Issue: 2, pp. 688-704, Retrieved from https:// doi.org/10.1108/BFJ-11-2013-0334

TURKSTAT, Türkiye Istatistik Kurumu (TÜİK). (2003). Gıda maddeleri tüketim harcaması miktarları ve toplam değerleri, Türkiye, 2003. Retrieved from http://tuik.gov.tr/PreTablo.do?alt_id=1012

TURKSTAT, Türkiye İstatistik Kurumu (TÜİK). (2012). Türkiye İstatistik Kurumu, Küresel Yetişkin Tütün Araştırması, 2012. Retrieved from http://www.tuik.gov.tr/PreHaberBultenleri.do?id=13142

TURKSTAT, Türkiye İstatistik Kurumu (TÜİK). (2016a). Türkiye İstatistik Kurumu, İstatistiklerle Kadın, 2016. Retrieved from http://www.tuik.gov.tr/PreHaberBultenleri.do?id=24643

TURKSTAT, Türkiye İstatistik Kurumu (TÜİK). (2016b). Türkiye İstatistik Kurumu, Adrese Dayalı Nüfus Kayıt Sistemi Sonuçları, 2016. Retrieved from http://www.tuik.gov.tr/PreTablo.do?alt_id=1059

Uma, R., & Selvam, V. (2016). Factors Hindering towards Purchase of organic Food Products. *IOSR Journal of Humanities and Social Science*, *21*(07), 92-96. doi:10.9790/0837-2107089296

UN. (2015). Hunger and food security - United Nations Sustainable Development. Retrieved from https://www.un.org/sustainabledevelopment/hunger/

Underhill, S.E. and Figueroa, E.E. (1996), "Consumer preferences for non-conventionally grown produce", *Journal of Food Distribution Research*, Vol. 27, pp. 56-66.

United Nations Conference on Environment and Development (1992). Rio Declaration on Environment and Development, UNCED Doc. A/CONF.151/5/Rev. 1, 31 ILM 874 Retrieved from http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

UNFCCC. (2015). The Paris Agreement | UNFCCC. Retrieved from https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

USDA. (2016a). Organic Production/Organic Food: Information Access Tools | Alternative Farming Systems Information Center| NAL | USDA. Retrieved from https://www.nal.usda.gov/afsic/organic-productionorganic-food-information-access-tools#define

USDA. (2016b). USDA Reports Record Growth In U.S. Organic Producers | USDA. Retrieved from https://www.usda.gov/media/press-releases/2016/04/04/usda-reports-record-growth-us-organic-producers

USDA. (2016c). *Turkish Organic Market Overview* (TR6005). Retrieved from USDA Foreign Agricultural Service, Global Agricultural Information Network website: https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Turkish%20Organic%20Market%20Overview_Ankara_Turkey_1-26-2016.pdf

USDA. (2017). Certified Organic Survey 2016 Summary. Retrieved from http://usda.mannlib.cornell.edu/usda/current/OrganicProduction/OrganicProduction-09-20-2017_correction.pdf

USDA. (2018). Organic Standards | Agricultural Marketing Service. Retrieved from https://www.ams.usda.gov/grades-standards/organic-standards

Vetter, H., & Karantininis, K. (2002). Moral hazard, vertical integration, and public monitoring in credence goods. *European Review of Agriculture Economics*, *29*(2), 271-279. doi:10.1093/eurrag/29.2.271

Vindigni, G., Janssen, M.A. and Jager, W. (2002), "Organic food consumption: a multi-theoretical framework of consumer decision making", *British Food Journal*, Vol. 104 No. 8, pp. 624-42.

Vogt, G. (2007). The origins of organic farming. *Organic farming: an international history*, 9-29. doi:10.1079/9780851998336.0009

Walz, E. (2004). *Final results of the fourth National Organic Farmers' Survey: Sustaining organic farms in a changing organic marketplace*. Santa Cruz, Calif. (P.O. Box 440: Organic Farming Research Foundation.

Wandel, M., & Bugge, A. (1997). Environmental concern in consumer evaluation of food quality. *Food Quality and Preference*, *8*(1), 19-26. doi:10.1016/s0950-3293(96)00004-3

Wier, M., O´Doherty Jensen, K., Andersen, L. M., & Millock, K. (2008). The character of demand in mature organic food markets: Great Britain and Denmark compared. *Food Policy*, 33(5), 406–421.

WFP. (2015). UN World Food Programme. Retrieved from https://www.wfp.org/stories/10-facts-about-hunger

What makes organic agriculture move - protest, meaning or market? A polyocular approach. (2005). In Alrøe & Noe (Eds.), *the XXI ESRS Congress in Hungary, August 22-25, 2005. Working group 5: Continuity and change in organic farming – philosophy, practice and policy*. Retrieved from http://orgprints.org/10683/1/Alroe%2BNoe-2005-What_makes_organic_agriculture_move.pdf

WHO, & FAO. (2007). *Organically Produced Food* (Third Edition). Retrieved from http://www.fao.org/docrep/pdf/010/a1385e/a1385e00.pdf

WHO. (2017a, October 31). Food safety. Retrieved from http://www.who.int/news-room/fact-sheets/detail/food-safety

WHO. (2017b, November 7). Stop using antibiotics in healthy animals to preserve their effectiveness. Retrieved from http://www.who.int/news-room/detail/07-11-2017-stop-using-antibiotics-in-healthy-animals-to-prevent-the-spread-of-antibiotic-resistance

WHO. (2018a). Obesity and overweight.

Retrieved from http://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight

WHO. (2018b). Pesticide residues in food.

Retrieved from http://www.who.int/news-room/fact-sheets/detail/pesticide-residues-in-food

Worner, F. and Meier-Ploeger, A. (1999), "What the consumer says", *Ecology and Farming*, Vol. 20, January-April, pp. 14-15.

Worthington, V. (1998). Effect of Agricultural Methods on Nutritional Quality: A Comparison of Organic with Conventional Crops. *Alternative Therapies in Health and Medicine. 4(1)*.

Wynen, E. (2003). Organic grain farming in Australia - Production, Profitability and the Market. *Paper presented at the Barley Symposium,* Adelaide, September

2003. Retrieved from http://www.elspl.com.au/OrgAg/4-OA-Pubs/4-OA-Publications/Pub-A-FP/OA-FP-A20-BarleyAdelaide2003.pdf

Xie, B., Wang, L., Yang, H., Wang, Y. and Zhang, M. (2015) "Consumer perceptions and attitudes of organic food products in Eastern China", *British Food Journal*, Vol. 117 Issue: 3, pp. 1105-1121, Retrieved from https://doi.org/10.1108/BFJ-09-2013-0255

Yin, S., Wu, L. and Chen, Y. (2010), "Consumer's purchase intention of organic food in China", *J Sci Food Agric*, Society of Chemical Industry 2010, 90, pp.1361-1367, doi: 10.1002/jsfa.3936

Yiridoe, E. K., Bonti-Ankomah S. and Martin R. C. (2005), "Comparison of consumer perceptions and preference toward organic versus conventionally produced foods: A review and update of the literature", *Renewable Agriculture and Food Systems*, 20(4), pp. 193-205

Zagata, L. (2008). Bio cash-cow? Context and content of Czech organic farming. *Agricultural Economics (Zemědělská ekonomika)*, *53*(No. 1), 45-53. doi:10.17221/993-agricecon

Zanoli, R. (1998), "The economics and policy of organic farming: the state-of-the-art", Proceedings of the 4th ENOF Workshop, Edinburgh, 25-26 June, pp. 57-68.

Zanoli, R. and Naspetti, S. (2002), "Consumer motivations in the purchase of organic food. A Means-end Approach", *British Food Journal*, Vol. 104, No. 8, 2012, pp. 643-653

Zotos, Y., Ziamou, P. & Tsakiridou, E. (1999), "Marketing organically produced food products in Greece", *Greener Management International*, Vol. 25, Spring, pp. 91-104.

APPENDIX A. LOGISTIC REGRESSION

In the study, logistic regression analysis is applied in several econometric models. This section aims to explain logistic regression in details, the results of the models are given in related chapters.

Logistic regression is a method that helps to make the classification and assignment process where the expected values of the response variable are obtained as probabilities according to the explanatory variables/risk factors (O'Connell, 2006). Logistic regression models have been widely used in biology, medicine, economics, agriculture, veterinary and transportation fields and it allows to estimate the value of the dependent variable as a probability and to classify it according to probability rules.

The use of the logistic model for the analysis of biological experiments was first proposed by Berkson (1944), and Cox (1970) reviewed the model for various applications and Anderson (1979, 1983) summarized it. The widespread use of logistic regression models has led to the development of error prediction methods and a more detailed analysis of logistic regression models. Cornfield (1962) firstly introduced the discriminant function approach in the logistic regression coefficient estimation process (Cornfield, 1962).

The logistic regression analysis applied when the dependent variable contains a binary or categorical response. The scale of two categorical answer variables is nominal, ordered scale. In the binary logistic regression model, the categories should contain a binary response (e.g. Yes-No, Ill-Healthy, Less-Many etc.). The binary logistic regression establishes the relationship between one or more explanatory variables and the binary response variable. Explanatory variables; may be factor

variables, risk factors or covariate. Explanatory variables that are risk factors or causal factors can be categorical, nominal, or ordered scales. Common variables must be continuous variables (Hosmer and Lemeshow, 2013). We predict the likelihood of success or failure depending on a conditional set of independent variables (Powers and Xie, 2000).

When there are non-linear regression and binary dependent variables, the effect of interrelation between variables and its consequences can be analyzed through logit regressions. In such cases where the dependent variable consists of more than two categories multinomial or ordered logit regression models are applied.

In any case where the dependent variable is categorical, the application of maximum likelihood estimation is more suitable than ordinary least squares method. Logistic regression model uses maximum likelihood estimation method. Other possible techniques for data analysis in the case of categorical dependent variables include discriminant analysis, probit analysis, logarithmic linear regression and logistic regression. The applicability of these mentioned techniques also requires different situations. For instance, while logarithmic linear regression requires that all independent or regressor variables be categorical, discriminant analysis predicts that all independent variables will be continuous. Logistic regression analysis, however, requires less assumptions in the presence of categorical and numerical independent variables. Logistic regression is similar to discriminant analysis in relation to the purpose of predicting a categorical additive variable and both require less assumption. On the other hand, logistic regression can be applied if assumptions required by discriminant analysis are provided. It also shows similarities with linear regression in terms of the presence of the regression equation as the theoretical infrastructure and interpretation of the coefficients (Hosmer and Lemeshow., 2013).

In terms of distribution, logit regression model uses the cumulative standard logistic distribution (F) whereas the probit regression model uses the cumulative standard normal distribution (Φ) (Stock and Watson, 2007). Moreover, it is possible to interpret the odds ratios of coefficients in logistic regression models. Both probit and logit models have similar estimation values (Horowitz and Savin, 2001).

As mentioned before, in probit and logistic models, β parameters are calculated with an estimator called maximum likelihood. In both models, the calculated parameter values are not interpreted to indicate size. It expresses the probability of whether the dependent variable is 1 or not, according to the independent variables. Generalized linear models include a link function that relates the mean of the response to the linear predictors in the model. The link function of logistic regression is as follows:

$$Pr(Y=1 \mid X) = [1+e-X'\beta] -1$$

Multicollinearity can inflate the variance amongst the variables and endanger the accuracy of the prediction (Belsley et al., 1980). When multicollinearity takes place, there are perfect and exact relationships between predictor variables. Stewart and Gill (1998) point out that the reason of this problem is any departure from orthogonality in the set of regressors. This situation causes having unreliable estimates and incorrect results between dependent and independent variables.

There are ways for detecting multicollinearity (Berry and Feldman, 1985). As a common indicator for collinearity, VIF analysis gives a highlight to determine which variables are interrelated. VIF analysis exhibits how much the variance is inflated as the standard error of the estimated coefficients are inflated when multicollinearity takes place. O'brien (2007) explains that to measure the collinearity problems with R^2 as it shows the proportion of variance in the independent variable *i* that is associated with other independent variables in the model and it is a perfect measure for collinearity problems. He denotes that tolerance for the independent variable *i* is $(1 - R^2\ i)$ shows the proportion of variance in i that is not related with other independent variables in the model. He adds that VIF accounts for the reciprocal of tolerance as $1/(1 - R^2\ i)$ showing that the impact of R^2 on the estimated coefficient for the independent variable *i*. There are rules for VIF analysis in detecting and solving multicollinearity problem, a common one is eliminating variables having higher values of VIF than 10 and tolerance less than 0.20 as other values indicate serious multicollinearity problems in the model (Menard, 1995; Neter et al., 1989). In this

study, we have measured VIF and tolerance values and eliminated some independent variables regarding this rule.

APPENDIX B: DESCRIPTION OF VARIABLES

Table B.1 Description of Variables in Terms of Survey Questions to All Participants

Variable	Description	N. Obs.	Mean
ORGANIC	1 = Participant purchases organic food products, 0 = Otherwise	688	0.32
MONTHLYINCOME[82]	The monthly income of households is between 1000-2000 TRY=1; 2001-3000 TRY=2; 3001-4000 TRY=3; 4001-5000 TRY=4; 5001-6000 TRY=5; 6001-7000 TRY=6; 7001-8000 TRY=7; 8001-9000 TRY=8; higher than 10000 TRY=9	688	2.41
SPORT	Physical activity level: no=0; low (sometimes)=1; moderate (several times)=2; high (every day)=3	688	0.86
SMOKE	1 = yes, 0 = no	688	0.46
VITAMIN*	Food product must be rich in vitamins	682	3.83
PROTEIN*	Food product must be rich in protein	677	3.97
NOURISHING*	Food product must be nourishing	679	3.88
WEIGHTCONTROL*	Food product must help weight control	682	3.75
LOWCALORIES*	Food product must contain low calories	677	3.88
LOWFAT*	Food product must contain low fat	677	3.87
DIGESTIVE*	Food product must be digestive	677	3.75
ENERGETIC*	Food product must be energetic	678	3.94
LIFEQUALITY*	Food product must improve life quality	683	3.85
PRODUCTIONCOUNTRY*	The country where the food is produced must be specified	687	3.83
ENVFRIENDLINESS*	Food product must be environmentally friendly	679	4.00
RECYCLEDPACK*	Food product must be properly packaged for recycling	680	3.82
NOCHEMICALS*	Food product must contain no chemicals	684	3.94
KNOWACIDRAIN*	I have information on acid rain	645	3.51
KNOWWATERPOLL*	I have information on water pollution	668	3.82
KNOWCARBONEMMISSION*	I have information on carbon emissions and greenhouse releases	640	3.51

[82] 1 TRY=0.2039 EURO as of April, 2018.

Variable	Description	N. Obs.	Mean
KNOWWORLDHUNGER*	I have information on world hunger	674	3.89
IMPPOLLUTION*	Environmental pollution is important	682	3.87
CONTRIBUTIONRECYCLING*	I contribute to recycling	680	3.78
ECOSELECTIVENESS*	I consume some food products due to ecological reasons	670	3.58
REDUCERISKILLNESS*	Organic food products reduce the risk of illness	683	3.84
THERAPEUTIC*	Organic food products are therapeutic	678	3.93
TASTEFUL*	Organic food products are tasteful	683	3.75
NUTRITIOUS*	Organic food products are nutritious	683	3.90
IMPROVEQUALITY*	The continuous use of organic food products improves the quality of life	682	3.73
AFFORDABLEPRICE*	Organic food prices are affordable	677	3.13
NODIFFERENCECONV*	Organic food products have no difference with their conventional counterparts	680	3.07
BRAND*	The brand choice in organic food consumption is important	684	3.77
VARIETY*	Organic food products are rich in variety	678	3.78
NOCONTAINOFDRUG*	Organic food products do not contain drugs	673	3.82
NODIFFERENCENATURAL*	Organic food products have no difference with natural food products	674	3.63
OWNCANCER***	Having cancer	688	0.04
OWNOBESITY***	Being obese	688	0.05
OWNDIABETES***	Having diabetes	688	0.08
OWNHEARTDIS***	Having heart and cardiovascular disease	688	0.15
OWNALLERGIES***	Having allergies	688	0.20
OWNPARKINSON***	Having Parkinson	688	0.52
FAMCANCER***	A family member has cancer	688	0.28
FAMOBESITY***	A family member is obese	688	0.21
FAMDIABETES***	A family member has diabetes	688	0.31
FAMHEARTDIS***	A family member has heart and cardiovascular disease	688	0.40
FAMALLERGIES***	A family member has allergies	688	0.25
FAMPARKINSON***	A family member has Parkinson	688	0.12
LOGO1***	I recognize Logo 1	688	0.55
LOGO2***	I recognize Logo 2	688	0.72
LOGO3***	I recognize Logo 3	688	0.49

Variable	Description	N. Obs.	Mean
LOGO4***	I recognize Logo 4	688	0.72
LOGO5***	I recognize Logo 5	688	0.70
LOGOORG1**	Whether Logo 1 represents organic food products	688	1.56
LOGOORG2**	Whether Logo 2 represents organic food products	688	1.41
LOGOORG3**	Whether Logo 3 represents organic food products	688	1.56
LOGOORG4**	Whether Logo 4 represents organic food products	688	1.40
LOGOORG5**	Whether Logo 5 represents organic food products	688	1.36
FAMILYFRIENDS***	I have information on organic food products from my family or friends	688	0.61
TVRADIO***	I have information on organic food products from TV and radio	688	0.62
SOCIALMEDIA***	I have information on organic food products from social media	688	0.50
DOCTORREC***	I have information on organic food products through doctor recommendations	688	0.23
OTHERSOURCES***	I have information on organic food products from other sources	688	0.05
ADVTVRADIO***	I track food advertisements through TV and radio	686	2.64
ADVBILLBOARD***	I track food advertisements through billboards and leaflets	686	2.41
ADVSOCIALMEDIA***	I track food advertisements through social media	686	2.51
ADVANNOUNCEMENTS***	I track food advertisements through announcements in shopping places	686	2.70
CONFIDENCEONADV	1 = I trust food advertisements, 2 = I think that food advertisements are exaggerated 3 = I do not trust on food advertisements	688	1.99
RFP	1 = I am the only person who is responsible for the food purchase 2 = Me and another person are responsible for the food purchase 3 = Another person is responsible for the food purchase	688	1.50

* Score: 5. strongly agree 1. strongly disagree

** Score: 1. Logo represents organic food products 2. Logo does not represent organic food products 3. The respondent has no information whether Logo represents organic food products or not

*** Score: 1 = yes, 0 = no

Table B.2 Description of Variables in Terms of Survey Questions to Organic Consumers

Variable	Description	N. Obs.	Mean
SUPERMARKET**	I purchase organic food products from supermarkets	224	0.40
DISCOUNT**	I purchase organic food products from discount markets	224	0.17
OPENBAZAAR**	I purchase organic food products from open bazaars	224	0.26
ORGSHOP**	I purchase organic food products from organic and natural products shop	224	0.51
ORGBAZAAR**	I purchase organic food products from organic bazaars	224	0.38
SPECIALTYSHOP**	I purchase organic food products from specialty shops	224	0.25
FARM**	I purchase organic food products from farms	224	0.16
ONLINE**	I purchase organic food products through online channels	224	0.027
CERTCONFIDENCE	1 = I trust organic certifications 2 = I do not trust on organic certifications 3 = I am indecisive about trusting organic certifications	224	1.79
ORGFRESH***	I consume organic fresh fruits and vegetables	224	1.93
ORGMEAT***	I consume organic meat and meat products	224	2.01
ORGMILK***	I consume organic milk and milk products	224	1.96
ORGCEREAL***	I consume organic cereals	224	1.78
ORGBAKERY***	I consume organic bakery products	224	1.89
ORGLEGUMES***	I consume organic legumes	224	1.91
ORGEGG***	I consume organic eggs	224	2.03
ORGBABYFOOD***	I consume organic baby food products	224	1.45
ORGDRIED***	I consume organic dried fruits, vegetables and nuts	224	1.82
ORGDRINKS***	I consume organic drinks	224	1.88
ORGOIL***	I consume organic oil	224	1.99
ORGSUGARY***	I consume organic sugary food products	224	1.75
ORGSWEET***	I consume organic chocolate and sweet snacks	224	1.66
ORGOLIVE***	I consume organic olives	224	1.94
ORGSPICE***	I consume organic spices	224	1.85
WTP	How much more (as a percentage of the price you pay) I am willing to pay for each product type under consideration: 0-20%, 20-40%, 40-60%, 60-80%, 80-100%, 100-200%, 200-300%, 300-400%, 400% and more.	228	1.96
MONTHLYINCOME	The monthly income of households is between 1000-2000 TRY=1; 2001-3000 TRY=2; 3001-4000 TRY=3; 4001-5000 TRY=4; 5001-6000 TRY=5; 6001-7000 TRY=6; 7001-8000 TRY=7; 8001-9000 TRY=8; higher than 10000 TRY=9	223	2.67
MOTHEALTH*	I consume organic food because it is healthier for me and my family	223	4

Variable	Description	N. Obs.	Mean
MOTFOODSAFETY*	I consume organic food because it guarantees my food safety	223	4.05
MOTANIMALWELFARE*	I consume organic food because animals are better treated in production	216	3.83
MOTLESSPOLL*	I consume organic food because their production creates less pollution	221	3.90
MOTTASTE*	I consume organic food because it is more tasteful	222	3.72
MOTFRESHNESS*	I consume organic food because it is more fresh	222	3.84
MOTNUTRITION*	I consume organic food because it is more nutritious	222	3.79
MOTSUPPORTLOCAL*	I consume organic food because I support local/small farmers	222	3.88
MOTSUSTAINABILITY*	I consume organic food because I want to support agriculture and sustainability	222	3.97
MOTBENEVOLENCE*	I consume organic food because I want to preserve natural resources	223	3.88
MOTDOCTOR*	I consume organic food because doctors recommend it	221	3.82
MOTPOPULARITY*	I consume organic food products because it is a popular trend	221	3.81
BARSHORTSTORAGE***	I have problems due to short term storage in consuming organic food products	224	1.20
BARAPPEARANCE***	I have problems due to appearance deficiencies in consuming organic food products	224	1.13
BARTASTE***	I have taste problems in consuming organic food products	224	0.99
BARAVAILABILITY***	I have availability problems in consuming organic food products	224	1.52
BARVARIETY***	I have food variety problems in consuming organic food products	224	1.69
BARLONGCOOK***	I have problems due to long cooking duration in consuming organic food products	224	1.62
SIGNALMINLOGO****	I notice organic food products by the Ministry logo	224	1.43
SIGNALCERTLOGO****	I notice organic food products by the certification and control body name and logo	224	1.67
SIGNALBRAND****	I notice organic food products by the manufacturer name and information	223	1.67
SIGNALORGANICNAME****	I notice organic food products by the “organic” label	222	1.59
SIGNALINGREDIENT****	I notice organic food products by the information regarding contents, origin, etc.	223	1.82
SIGNALAPPEARANCE****	I notice organic food products by packaging and appearance properties (e.g. being in a trapezoidal structure)	220	1.72
SIGNALORGANICBOARD****	I notice organic food products by the organic signboard in the shopping environment	222	1.76

Variable	Description	N. Obs.	Mean
SPORT	Physical activity level: no=0; low (sometimes)=1; moderate (several times)=2; high (every day)=3	224	1.28
DOCTORREC***	I have information on organic food products through doctor recommendations	224	0.34

* Score: 5. strongly agree 1. strongly disagree

** Score: 1 = yes, 0 = no

*** Score: 0 = not at all, 1= rarely, 2 = usually, 3 = frequently

Table B.3 Logo Types that are shown to Participants

Logo	Specification
	Logo 1 belongs to the official organic logo made by Ministry of Agriculture and Forestry in Turkey. Products bearing this logo are certified in accordance with organic standards set by the Turkish organic law.
	Logo 2 is an example brand logo. It does not guarantee that the products are certified and fulfill organic standards.
	Logo 3 belongs to "good agricultural practices and it is generated the Ministry of, Agriculture and Forestry.
	Logo 4 is an example brand logo. It does not guarantee that the products are certified and fulfill organic standards.
	Logo 5 is an example brand logo for natural products. It does not guarantee that the products are certified or fulfill organic standards.

APPENDIX C: DESCRIPTION OF VARIABLES

Table C.1 Description of Variables in the Econometric Model 1

Variable	Description	N. Obs.	Mean
ORGANIC	1 = Participant produce organic food products, 0 = Otherwise	254	0.36
EMPLOYERUNION**	We have memberships to professional associations	254	0.56
CERTCOST*	We believe that certification cost is an entry barrier to organic food sector	213	3.79
TRANSCOST*	We believe that transportation cost is an entry barrier to organic food sector	243	4.37
LOWDEMAND*	We believe that low demand is an entry barrier to organic food sector	245	4.37
LANDDISADV*	We believe that land disadvantage is an entry barrier to organic food sector	193	4.33
LACKGOVINCENTIVE*	We believe that lack of governmental incentives is an entry barrier to organic food sector	232	4.22
UNAWARENESS*	We believe that unawareness of consumers on organic food is an entry barrier to organic food sector	236	4.37
DATASYSTEM*	We believe that the insufficiency of data systems is an entry barrier to organic food sector	223	4.12
IMPORTEDGOODS*	We believe that the presence of imported organic food products in the market is an entry barrier to organic food sector	222	4.02
EMPLIGNORANCE*	We believe that employees' ignorance is an entry barrier to organic food sector	251	4.42
MOREUNITCOSTCONV*	We believe that the cost disadvantage of organic food products compared with their conventional counterparts is an entry barrier to organic food sector	237	4.43
EMPNUMBER***	Our employee number	254	2.39
INCENTIVEUSE**	We use government incentives	254	0.24
WORKEREDUC**	Our workers have professional education and followed professional training programs	254	0.78
ENVCONSCIOUSNESS****	Degree of environmental consciousness of the participant	254	3.64

* Score: 5. strongly agree 1. strongly disagree

** Score: 1 = yes, 0 = no

*** Score: 1,2,3,4= The firm's employee number is between 1-9 / 10-49/ 50-249/ 250 and more

****Score: 5. strongly agree 1. strongly disagree. The participants have answered several questions in terms of their knowledge on

Variable	Description	N. Obs.	Mean
environmental issues like acid rains, water pollution, carbon emissions and greenhouse gas releases, world hunger and whether they are selective to consume some food products due to ecological reasons. The variable of "ENVCONSCIOUSNESS" is calculated by the mean of those questions that are ranked 1 to 5.			

Table C.2 Description of Variables in the Econometric Models 2, 3 and 4

Variable	Description	N. Obs.	Mean
INCUMBENT	1 = We produce organic food products, 0 = Otherwise	92	0.45
FIRMSIZE	1= We have a large sized firm 0= We have a small-medium sized firm	92	0.33
PRODUCTTYPE	1= We produce organic processed food, 0 = We producer organic raw food	92	0.58
EMPLOYERUNION**	We have memberships to professional associations	92	0.60
INCENTIVEUSE**	We use government incentives	92	0.22
CERTCOST*	We believe that certification cost is an entry barrier to organic food sector	78	3.96
TRANSCOST*	We believe that transportation cost is an entry barrier to organic food sector	85	4.38
LACKGOVINCENTIVE*	We believe that lack of governmental incentives is an entry barrier to organic food sector	232	4.22
UNAWARENESS*	We believe that unawareness of consumers on organic food is an entry barrier to organic food sector	87	4.54
DATASYSTEM*	We believe that the insufficiency of data systems is an entry barrier to organic food sector	83	4.18
IMPORTEDGOODS*	We believe that the presence of imported organic food products in the market is an entry barrier to organic food sector	83	4.30
NOPROVINCEUNIT*	We believe that the lack of organic agricultural province-district units is an important entry barrier into the organic food sector	85	4.29
LACKBROADCASTING*	We believe that the lack of broadcasting about organic is an important entry barrier into the organic food sector	88	4.39
EMPLIGNORANCE*	We believe that employees' ignorance is an entry barrier to organic food sector	90	4.41
ADVPRESS*****	Our organic food products are advertised in press	92	1.47
ADVBILLBOARD*****	Our organic food products are advertised on billboards	92	1.57
ADVSHOPPLACE*****	Our organic food products are advertised at shopping places	92	1.71
ENTRYYEAR	The entry year of our firm to the food sector	92	1996
EMPNUMBER***	Our employee number	92	1.35
WORKEREDUC**	Our workers have professional education and followed professional training programs	92	0.75
WORKERORGEDUC**	Our workers have professional education and followed professional training programs on organic agriculture	92	0.53
CERTNATIONALITY	1, 2= The respondent is working with a national/international control and certification company respectively	92	1.11

Variable	Description	N. Obs.	Mean
ENVCONSCIOUSNESS****	Degree of environmental consciousness	92	3.85

* Score: 5. strongly agree 1. strongly disagree

** Score: 1 = yes, 0 = no

*** Score: 1,2,3,4= The firm's employee number is between 1-9 / 10-49/ 50-249/ 250 and more

****Score: 5. strongly agree 1. strongly disagree. The participants have answered several questions in terms of their knowledge on environmental issues like acid rains, water pollution, carbon emissions and greenhouse gas releases, world hunger and whether they are selective to consume some food products due to ecological reasons. The variable of "ENVCONSCIOUSNESS" is calculated by the mean of those questions that are ranked 1 to 5.

***** Score: 1, 2, 3, 4= never/ rarely/ moderately/ very often

Table C.3 Description of Variables in the Econometric Model 5

Variable	Description	N. Obs.	Mean
NEWENTRANT	1 = We produce organic food products, 0 = Otherwise	162	0.45
PRODUCTTYPE	1= We produce organic processed food, 0 = We producer organic raw food	162	0.54
EMPLOYERUNION**	We have memberships to professional associations	162	0.53
INCENTIVEUSE**	We use government incentives	162	0.25
CERTCOST*	We believe that certification cost is an entry barrier to organic food sector	135	3.68
TRANSCOST*	We believe that transportation cost is an entry barrier to organic food sector	158	4.36
LOWDEMAND*	We believe that low demand is an entry barrier to organic food sector	158	4.37
LANDDISADV*	We believe that land disadvantage is an entry barrier to organic food sector	122	4.31
UNAWARENESS*	We believe that unawareness of consumers on organic food is an entry barrier to organic food sector	149	4.26
DATASYSTEM*	We believe that the insufficiency of data systems is an entry barrier to organic food sector	140	4.07
IMPORTEDGOODS*	We believe that the presence of imported organic food products in the market is an entry barrier to organic food sector	139	3.84
NOPROVINCEUNIT*	We believe that the lack of organic agricultural province-district units is an important entry barrier into the organic food sector	139	4.12
EMPLIGNORANCE*	We believe that employees' ignorance is an entry barrier to organic food sector	161	4.42
MOREUNITCOSTCONV*	We believe that the cost disadvantage of organic food products compared with their conventional counterparts is an entry barrier to organic food sector	153	4.42
EMPNUMBER***	Our employee number	162	2.40
WORKEREDUC**	Our workers have professional education and followed professional training programs	162	0.79
ENVCONSCIOUSNESS****	Degree of environmental consciousness	162	3.51

* Score: 5. strongly agree 1. strongly disagree

** Score: 1 = yes, 0 = no

*** Score: 1,2,3,4= The firm's employee number is between 1-9 / 10-49/ 50-249/ 250 and more

****Score: 5. strongly agree 1. strongly disagree. The participants have answered several questions in terms of their knowledge on environmental issues like acid rains, water pollution, carbon emissions and greenhouse gas releases, world hunger and whether they are selective to consume some food products due to ecological reasons. The variable of "ENVCONSCIOUSNESS" is calculated by the mean of those questions that are ranked 1 to 5.

***** Score: 1, 2, 3, 4= never/ rarely/ moderately/ very often

CURRICULUM VITAE

Nazife Merve Hamzaoğlu

Date of Birth/ Place of Birth: 22/04/1986 / Istanbul

Address: Ataköy 6. Kısım, Adnan Kahveci Bulvarı, Ataköy Konakları, B1-2 Blok, Daire: 9 Ataköy, 34158, Bakırköy / ISTANBUL

E-mail: mhmervehamzaoglu@gmail.com

Education:

2012-2018 PhD in Economics Galatasaray University

2010-2011 MSc in Management Brunel University

2005-2010 BA in Economics Sabancı University

Work:

08/2015-08/2016 Teaching Consultant Avrupa Education Foundation, Ist

TEZ ONAY SAYFASI

Üniversite	: T.C. GALATASARAY ÜNİVERSİTESİ
Enstitü	: SOSYAL BİLİMLER ENSTİTÜSÜ
Hazırlayanın Adı Soyadı	:Nazife Merve HAMZAOĞLU
Tez Başlığı	:The Development and Constraints in The Organic Food Market in Turkey
Savunma Tarihi	: 25 / 10 / 2018
Danışmanı	: Bilge ÖZTÜRK GÖKTUNA

JÜRİ ÜYELERİ

Unvanı, Adı Soyadı	İmza
Prof. Dr. Sahir KARAKAYA	
Doç. Dr. Bilge ÖZTÜRK GÖKTUNA	
Doç. Dr. Bülent ANIL	
Doç. Dr. Sevgi İNECİ	
Doç. Dr. Rıfat Barış TEKİN	

Enstitü Müdürü
Prof. Dr. M. Yaman ÖZTEK