CUKUROVA UNIVERSITY
INSTITUTE OF NATURAL AND APPLIED SCIENCE

MSc. THESIS

Hamzah Yaseen Taha AL-TEKREETI

THE EFFECT OF β-CAROTENE AND VITAMIN E+ SELENIUM INJECTION ON REPRODUCTIVE PERFORMANCE IN GOATS BEFORE MATING SEASON

DEPARTMENT OF ANIMAL SCIENCE

ADANA-2020

ABSTRACT

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THE EFFECT OF β-CAROTENE AND VITAMIN E+SELENIUM INJECTION ON REPRODUCTIVE PERFORMANCE IN GOATS BEFORE MATING SEASON

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Year: 2020, Pages:55
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The aim of this study was to investigate the effect of beta-carotene and vitamin E+Selenium supplementation on reproductive performance on the goats before mating season. Randomly 80 animals were divided into four groups every group had 20 animals, The first were for the (BC), second for (vit E+Se), third mixture of the (BC and vit E+Se) and the fourth for control. After divided the animals into four groups we were injected (IM) every animal weekly for four weeks, (5ml) from BC the first group, (5 ml) from Vit E + Se for the second group, (2.5 ml) from BC and (2.5 ml) from Vit E + Se and the fourth it was a control. The results showed the effect of the Vit E + Se on the reproductive performance and were found out significant, as for other supplements were found out insignificant on the performance.

Keywords: Reproductive Performance, Beta-Carotene, Vitamin E-Selenium, Live Weight, Breeding Season

ÖZ

YÜKSEK LİSANS TEZİ

B-KAROTEN VE VİTAMİN E-SELENYUM ENJEKSİYONUNUN ÇİFTLEŞME MEVSİMİ ÖNCESİ KEÇİLERDE ÜREME PERFORMANSINA ETKİSİ

Hamzah Yaseen Taha AL-TEKREETI

ÇUKUROVA ÜNİVERSİTESİ
FEN BİLİMLERİ ENSTİTÜSÜ
ZOOTEKNİ ANABİLİM DALI

Danışman : Prof.Dr.Osman TORUN
Yıl 2020 , Sayfa:55
Jüri: : Prof.Dr.Osman TORUN
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Bu çalışmanın amacı, çiftleşme sezonu öncesinde beta-karoten ve E vitamini + Selenyum takviyesinin keçilerde üreme performansı üzerine etkisini araştırmaktır. Rastgele 80 hayvan, her grupta 20 hayvan olan dört gruba ayrıldı, Birinci (BC), ikinci (Vit E + Se), üçüncü (BC ve Vit E + Se) karışımı ve dördüncü kontrol grubunu oluşturdu. Hayvanları teke katım oncesi dört gruba ayırdıktan sonra, dört hafta boyunca her hayvana haftada bir (IM), birinci gruba BC (5 ml), ikinci gruba Vit E + Se (5 ml), üçüncü gruba BC (2.5 ml) ve Vit E + S (2.5 ml) ve dördüncü bir kontrol oldu. Sonuçlar, Vit E + Se'nin üreme performansı üzerindeki etkisini gösterdi ve önemli bulundu ve performans üzerinde önemsiz bulundu.

Anahtar Kelimeler: Üreme Performansı, Beta-Karoten, E Vitamini-Selenyum, Canlı Ağırlık , Üreme Sezonu

EXPANDED ABSTRACT

The goats in the every time are a essential small ruminats sort to the world, however in the last decade the worldwide goat population has grown up quicker than other smalls animals like cattle, buffalo, and sheep (Tolunay et al., 2016).

Estimated the number of goats in whole of world about one billion. The largest percentage of goats are present in the Asia (58.2%), Africa (32.7%), and the lowest percentage in Europe (1.7%), Ameica (3.5%) and Oceania (0.4) (Faostat, 2016).

Many of poor people at this time are suffering from lack of food and starving according to lack of production and distribution, and enough income to obtain eating of adequate quantity and good kind of food to achieve their needs (FAO, 2012 & WFP, 2012) since 1090s the want to keep safe indigenous goats have been recognized (Hammond, 1999).

The aim of the present study was to evaluate the reproductive performance of goat by use supplements β-carotene, vitamin E + selenium and combination of these supplementation on reproductive performance of goats.

The time between two consecutive behavioral signs of heat called the estrous cycle (Fatet et al. 2011). In the goats, the estrous cycle can be categorized as a short period (keeps continue less than 17 days) plain period (time span from 17-24 days) or long-term (more than 24 days) (Chemineau et al. 1992, Lopes et al. 2001).

The time of the estrous cycle that the female is accepts and receptive to be mounted by the male (standing oestrus) that's called the estrus. (Fatet et al. 2011).

Reproductive performance is considered one of the major of productivity determinants in dairy goat, in the goats the reproductive performance is a composite of different operations that effected by several conditions like developmental, genetic, environmental and the administrative factors (Khandoker et al. 2013).

Reproduction is a complex composite trait influenced by many components including puberty, estrus, ovulation, fertilization, embryo implantation, pregnancy, parturition, lactation, and mothering ability (Mia et al. 2013).

We well know the environmental influences on the reproductive performance because it determines the amount of light per day that is it affects the length and shortness of the day in the region (starts of the season breeding), and the environment is affected by the location of the country, actually farm animal genetic resources and the genetic of animal diversity is significant in the global livestock sector development context, sustainable diets, environmental alteration, heritage of cultural, biodiversity objectives, a number of articles cover one or various of these challenges of global and spotlight the significance of the best description of genetic resources of farm animal and get better keeping and strategies of management (Seré et al. 2008, Hoffmann 2010, Pilling et al. 2011).

The nutrition has an influence on the breeding seasonal is much weaker in the mediterranean or tropical weather **(**Boukhliq et al.1996, Zarazaga et al. 2005).

However, nourishment influence is generally described well, the mechanisms physiological that underlie these influences are understood poorly, so at this time, the whole comprehension of how and the time of nourishment influences rate of ovulation will simplify the application of aim nourishment in production sheep systems improve reproduction, and may supply approach alternative to reproduction management in the system of a commercial that does not rely on the use of exogenous hormones (Scaramuzzi et al. 2008).

The major component of economic success in the dairy flock is reproductive efficiency. It was reported that the concentrations plasma of Vit A and β-carotene have useful influences on reproduction (Hoagland et al.1988, Handler et al. 1998, Haliloglu et al. 2002).

The deficiency of Vit A and β-carotene leading to extended of the oestrus duration, cysts ovarian that result in depressed rates conception and early pregnancy abortions (Horvath et al. 1985, Hakkarainen et al. 1996).

The relationship between nourishment and physiology has played a key role in the performance of goat and that minerals nutrition has an important role too, has shown in the new researches. The most two important categories in breeding animals are the nutritional situation through gestation and the proper growth rate of lambs in early life and before puberty (Capote et al. 2011).

Vit E enhances body immunity metabolism and reproduction for the pig, so that consider as an essential nutrient that should be included in diets of its (McDowell et al. 2002, Umesiobi 2009).

Se has an important role in antioxidants so it considers one of the elements with a wide range of functionalities in the body. And ingress to the significant compounds such as several sialoproteins. One of the methods for improving the production and reproductive conditions of livestock is through utilizing enhancers of metabolic by optimizing the metabolism of nutrients and remove or decrease the condition of stress (Sevcikova et al. 2011, Hernández-García et al. 2015).

We showed the effect of vitamin E+selenium on the performance of the goats with the results have shown vitamin E+selenium had a positive effect on the performance of goats and on the body weight of the kids with ($p>0.05$) significant, so I did agree with (Sterndale, S., et al. 2018) that said supplementation with vitamine E and Se can improve reproductive performance, and growth performance of goats, might the vitamin are necessary for growth and fecundity in animals and for prevention of various disease conditions, might the vitamin did improve the reproductive activity especially the ovarian, might have a positive effect on the central nervous system that important to receives information from the environment of the animal and after that conveys this information to important tow organs the hypothalamus and the pituitary gland that's responsible for the secretion of the important hormones, as for the beta, the results had shown a negative effect on the performance and body weight with ($p<0.05$) significant, as for about the performance I did agree with (Kaewlamun, 2010) that said the carotene has a negative effect on the ovarian activity, might the carotene didn’t improve the

reproductive system and had a negative effect on the GnRH that responsible to stimulating releasing of two hormones (FSH) and (LH), the FSH stimulate follicle growth and LH stimulate ovulation so might from this reason did lead to had negative on the performance, and about the weight I did agree with (Arellano-Rodriguez et al., 2007; Meza-Herrera et al., 2011; Meza-Herrera et al., 2013ab) that were said there β-carotene has no positive effect on the body weight in goats, might the rumen bacteria function and cellulose digestion improved by the carotene. That leads to excretion of it out the body and doesn't affect the weight, Hino et al., (1993) said the supplement of carotene improves the rumen bacteria function, as for the mixture of the two supplement the results sometime showed a positive ($p>0.05$) significant and sometimes had shown a negative ($p<0.05$) significant, despite the effect of vitamin E and Selenium on reproductive performance, the lack of effect of this combination could be explained by the fact that the mechanism of vitamin E + Selenium works against the carotene mechanism or vice versa.

ACKNOWLEDGEMENT

I wish to express my sincere gratitude Prof. Dr. Osman TORUN my supervisor, for his invaluable and untiring efforts and for all his support and encouragement over the years. My colleagues and friends at the Department of Animal Science especially Meral BARLIK, and Onur YILMAZ for my Iraqi friends that they were helped me, and my parents and my family, I am truly blessed to have your love and support. Thank you for every sacrifice, for celebrating my joys and easing my failures. You are the pillars of strength in life, without you, none of this would be possible.

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LIST OF SYMBOLS AND ABBREVIATONS

BC	:Beta-carotene
VIT E	: Vitamıne A
SE	: Selemıum
GnRH	: Gonadotropin.
LH	: lutenızıng hormone
FSH	: Follıcle stımulatıng hormone
PG F2A	: Prostoglandın
P4	: Progesteron
VİT A	: Vitamıne A

1. INTRODUCTION

Recently the goats production is a type of primary livestock in the world the production of goats is essential origin of income in settlement units located within and among forests so there is no earth for the production of plant (Taşkın et al., 2010; Ataşoğlu, 2010).

The goats in the every time are a essential cattle sort to the world, however in the last ten age ago the worldwide goat population has grown up quicker than other cattle like buffalo, and sheep (Tolunay et al., 2016).

Estimated the number of goats in whole of world about one billion goats. The largest percentage of goats are present in the Asia (58.2%), Africa (32.7%), and the lowest percentage in Europe (1.7%), Ameica (3.5%) and Oceania (0.4%) (Faostat, 2016).

There are about more than thousand goat generation have been knewn in the whole world, and in Africa most generation are preserved in marginalized region with low inputs, basic administration and bad feeding (Rege, 1994).

These generations have obtained singular adaptive characteristic to continue the reproduction in these region, and take the most an important role in the support of poor people, particularly in the country side (Abegaz, 2014, Mwai et al., 2015, Sarangi, 2018).

Many of poor people at this time are suffering from lack of food and starving according to lack of production and distribution, and enough income to obtain eating of adequate quantity and good kind of food to achieve their needs (FAO 2012, WFP 2012, IFAD 2012) Since 1090s the want to keep safe indigenous goats have been recognized (Hammond, 1999) therefore these goats have an essential role to play in giving a best proteins and an income with relatively low inputs.

Consequently, therefore when we speak about the reproduction of goats we must remember the best countries in the world for goat production is Turkey (Daskiran, 2000) .

There are a lot of causes for a large number from goats to be sitting in Turkey, environmental and geographical situation, in addition the social and economic status of smallest ruminant owners make it very help to bred goats in the plateau of Anatolian, goats are multi-advantages animals which have been raise for flesh milk, felt and skin for many centuries in Anatolia, the meats and cheeses of goats are the chief sources of animal protein for the citizens of the mountain Turkish parts and surroundings (Yalcin, 1986).

In this study we have taken two breeds of goats, namely Alpine and Saanen, the saanen was fits entered for the first time to Australia in 1913, this breed like Anglo-Nubians, characterized by the best dairy breed, Saanen has been used up in rise the level of domestic breeds, this sort of goats are characterized by an active production, give a large quantities of milk, suitable to the cooler weathers, and sensitive to the sun, as for their weights its about 65 kg in 1958 British Alpines were originally entered to Australia (DPI 2019).

This breeds have been improved by intersection with Toggenburg and Saanen goats (OSU 1996).

Its has been used up extensively in rise the level of domestic breeds, it is greatest suited to mild climates with low moisture, where it is has the power to produce the heavy and medium milk (DPI 2019).

Tend the British Alpines as well to have an extended lactation and a good milk along the wintertime (OSU 1996).

Therefore, the aim of the present study was to evaluate the reproductive performance of goat by use supplements β-carotene, Se and vitamin E and combination of these supplementation on reproductive performance of goats.

2. LITERATURE REVIEW

2.1. Goat Reproduction

The reproduction of cattle is the most significant agricultural active in the worldwide. Since the ancient civilization of mesopotamia the goats have been a source of people nourishment and have been so distributed about the world, throughout the worldwide the goats are a significant source of flesh, skin and fiber. In the some parts of Australia are utilized to as a manner of weeds controlling, a lot of resolution and politics makers, and the leaders of universal companies up to this time show to bad appreciated the capitalism role of the goat has play about the early time of humanity, they had faced with impressive outcomes of basic investigations at this time, alongside with meaningful surveys, used experimental breakthrough information and datum that be seen that goats enable to be a reference model for other farm cattle sectors (Boyazoglu et al., 2005).

2.1.1. The Oestrous Cycle

The time between two consecutive behavioral signs of heat called the estrous cycle (Fatet et al , 2011).

In the goats, the estrous cycle can be categorized as a short period (keeps continue less than 17 days) plain period (time span from 17-24 days) or long-term (more than 24 days) (Chemineau et al., 1992; Lopes Junior et al., 2001) .

The changes in the reproductive system especially in the morphological of ovaries biochemical (follicle maturation, follicular recruitment and growth), and physiological (endocrine regulations) leading to the ovulation (Fatet et al., 2011).

The estrous cycle has two stages and split into the follicular phase and the luteal phase. The phase of the cycle that characterized development and growth of the ovulatory follicle and that include maturing of gonadotropin hormone (GnRH) dependent follicles till ovulation that phase is called the follicular phase,leading this process to the formation of follicles takes place during the life of fetal. In

ruminants, currently all guides are consistent together with the formation of the follicular formation being done during the life of fetal and with a decline in the number of remaining follicles during life (Garverick et al., 2010).

The luteal phase begins since the time of ovulation and ends with the retreating of the corpus luteum (luteolysis). GnRH dependant follicles keep growing, and at this time there is no ovulation because of the high concentration of progesterone that inhibits its, all this process happens during the luteal phase.

The finish of the luteal phase and the start of a new follicular phase is marked by the reduction of progesterone excretion and luteolysis (Fatet et al., 2011)

2.1.2. Ovulation and Oestrus Behaviour

Through the time of the estrus, there are a lot of exhibiting for the females like a restlessness, urinate, the tail keep movement, and oftentimes there is a yell, and attempt to near from male and approach to him, have swelling, at this time the vulva is hyperemic, and from the vagina, there is a discharge of mucus which may be aqueous at the first, and intensive, at the finish of oestrus ın goats, that's average period of the estrous is 36 hours, with a range of 24 to 48 hours (Fatet et al., 2011), ovulation normally occurs at the end or after the standing oestrus. The mating occurs during standing oestrus, therefore, usually before ovulation.

2.1.3. Endocrinology of the Estrous

The oestrous cycle is controlled by interactions of complex hormonal between the hypothalamus and its secretion of GnRH, the pituitary gland and its secretion of luteinizing hormone and follicle-stimulating hormone, oestradiol and inhibin secrete from ovarian follicles, progesterone and oxytocin secrete from the corpus luteum and prostaglandin F2α (PGE2) secrete from the uterus, the whole hormones are related by feedback processes (ovaries to hypothalamus and pituitary gland) and feed-forward processes (hypothalamus to the pituitary gland to ovaries),

the LH that secretion forms anterior pituitary this secretion of its are stimulated by the GnRH that is the production from the hypothalamus, which induces the ovulation (day 0) of a large follicle and catalyzes luteinization of the follicular remainder, at this moment develops of corpus luteum, during the luteal phase concentricity of progesterone (P4) start to increase and remains increase during the phase (Rubianes et al., 2003).

During days 16-18 after the ovulation, the uterus and secreted the PGE2 and encourages luteolysis, leading to a decrease in the concentration of P4 drops rapidly (McNeilly et al.,1991).

The marked of starts the follicular phase when the luteolysis, during the follicular phase, at first the LH pulse frequency responsible for the emergence, growth, and development of the follicles, the development of the ovulatory follicle is involved by both hormones LH and FSH, the oestradiol which secretes from the ovulatory follicle, that responsible for the behavioral signs of oestrus due to the increase in the secretion of the GnRH that leading to increasing the preovulatory LH hormone which in turn causes the ovulation 20–26 hours later and then luteinisation of follicular cells (Scaramuzzi et al., 2006).

At the finish of the luteal phase, the non-gravid uterus secrets the PGE2 that causes the luteolysis and decrease in the secretion of P4. The new follicular phase starts when the plasma concentrations of P4 decrease that leading to gradually removes the inhibition of GnRH secretion (Fatet et al., 2011)

2.1.4. Seasonality of Reproduction

Goats are seasonal breeders by nature and the variation in day length has an effect on the reproductive cyclicity.

In semitropical and temperate areas, the reduction of the hours daylight (negative photoperiod) has an effect and stimulate on the breeding season with the biggest proportion of pregnancy occurring at the fall and winter (Fatet et al., 2011).

Pregnancy during the fall and winter outcome in giving birth in spring, especially when the nutrition and the environmental situation more suitable for the animals (Scaramuzzi et al., 2006; Fatet et al., 2011).

The variance in day extent rely on geographical position to the country and that affects on the start and time of the season of breeding. the variance in the daytime is so big that sheep and goats tend to seasonal completely, in generally during winter season females appearance behavioral signs of oestrus (Chemineau et al., 1992; Rosa et al., 2003).

In semi-tropical latitudes, observed in most breeds of sheep and goats on their reproductive activity at the seasonal variations, and breed and/or nutrition availability can be an effect on the sexual activity (Nogueıra**.**, 2015).

The response to photoperiod involves a complex process, including the detection of the photoperiod includes a complex process when a response to its, involving the disclosure of lighting by the retina, hypothalamus control of circadian rhythm and pineal gland excretes the melatonin. during darkness, the pineal gland excretes melatonin which in turn influences the control of the photoperiodic for the reproductive patterns, hypothalamic-pituitary-gonadal feedback, and secretion of GnRH (Chemineau,et al. 1992; Fatet, et al. 2011).

Furthermore, the breeding season of sheep starts of the is primarily according to alternative in the responsiveness of the hypothalamus to the passive feedback of oestradiol (Rosa and Bryant 2003).

The variation in the seasonality and starts of the breeding season between goats breeds have been reported in the written works (Amoah et al.,1996; Freitas et al., 2004).

That highlights the effecy of genotype on reproductive cyclicity in goats. In sheep, various responses between breeds to photoperiod could be due to various genetic abilities to secrete melatonin or various in sign transmission through brain or various in responsiveness to circulating concentrations of oestradiol (Rosa and Bryant 2003).

2.2. Reproduction Performance

Reproductive performance is considered one of the major of productivity determinants in dairy goat, in the goats the reproductive performance is a composite of different operations that effected by several conditions like developmental, genetic, environmental and the administrative factors (Mia et al., 2013).

Worthy difference between various litter size saw in age at puberty, pregnancy, and breeding at the first age, however in the situation gestation period difference has been found not important (Zeshmarani et al., 2007). The period of postpartum anoestrus has an effect on the season of parturition and on the reproduction efficiency of goats (Awemu et al., 1999).

Nevertheless, there is no influence on significant service period and kidding interval by season birth, the in spite of longer kidding interval has been observed in the cold dry season (Alexandre et al., 2001).

2.3. Factors Effect on Goat Reproduction

Reproduction is a complex composite trait influenced by many components including puberty, estrus, ovulation, fertilization, embryo implantation, pregnancy, parturition, lactation, and mothering ability (Mia et al., 2013).

Generally speaking reproduction of livestock is a way for the fulfillment of positive socio-economic alteration, during the improved quality of life and income (Adesehinwa et al., 2004).

Genetic and factors of the environment have affected on the reproductive traits (Greyling 2000; Song et al., 2006).

In addition to effect of the genetic and environmental on the performance the nutrition has also effect on the reproductive performance, selenium is considered as the main element. It has effect on the health and animals'

performance, vitamin E has immense importance and optimizing fertility rates and litter size in sows (Umesiobi 2009)**.**

Beta carotene supplementation has influence on the activity of ovarian by increasing the follicles number, corpus luteum and progesterone concentration (Arellano-Rodriguez et al., 2007).

2.3.1. Environmental

We well know the environmental influences on the reproductive performance because it determines the amount of light per day that is it affects the length and shortness of the day in the region (starts of the season breeding), and the environment is affected by the location of the country, the expression of a specific sign (phenotype) in an animal rely on the combined effect of both, environmental factors and genetic factors (genotype), the major factors of environmental effecting on reproduction of animal are the temperature of the area, moister, rain amount and distribution, radiation solar and photoperiod, feeding, management of the productive system, social interactions between the person at the like population, interactions of predator-prey, parasite and interactions of pathogen-host (Burns et al., 2010; Giwercman & Giwercman, 2011; Sadleir, 1968; Taberlet et al., 2011; Burns et al., 2010).

Wild mammals' generality, particularly those of longevity and has great size are to some range, seasonality. These animals limit their activity mating and births of the offspring to well-known seasons of the year, nevertheless, several from species of domestic animals like pigs, rabbits, and cattle show no seasonal on their breeding if they are growing in environments with climatic mild changes during the year (Goldman et al., 2003).

There are two types of factors (intrinsic and extrinsic) that have an effect on seasonal reproduction in any animal. The factors that connected to the genotype and belong to the individual itself its intrinsic factors, while the factors connected to the environment of animals its extrinsic factors. that are critical on the activity of

reproductive can be classified as a proximate and final factor, according to the time when they act on the breeding activity, mainly mostly, food availability is the most important ultimate factor and has an effect on the balance of energetic balance (Bronson, 2009).

At the end mainly mostly, the females' counterparts will tend to have shorter than breeding seasons males, since ovarian follicle maturation and ovulation commonly requires less time to complete than the formation of the sperms (spermatogenesis)(Simpson et al.,1982; Schlatt et al., 1995)

2.3.2. Genetic

Actually farm animal genetic resources and the genetic of animal diversity is significant in the global livestock sector development context, sustainable diets, environmental alteration, heritage of cultural, biodiversity objectives. A number of articles cover one or various of these challenges of global and spotlight the significance of the best description of genetic resources of farm animal and get better keeping and strategies of management (Hoffmann, 2010; Pilling & Hoffmann, 2011; Van der Zijpp et al.,2008).

The goat's fertility is partially referred to the best strategies of management, nutrition supply, targeting production of kids for marketing (Tolera, 1998; Akpa et al., 2010).

Noticed litter size is influence by the breeding of males and females as a signal of the contribution of the genetic of both the male and female to the performance of their offsprings, consequently, parents with a high possibility for twining or triplets may probably award birth to off-springs with high litter size possibility, hence can be improved this feature during the chosen (Turner, 1978).

Nevertheless, whole that litter size look-alike to be the most helpful for the selection standard for improvement of the genetic of production meat production (Amoah & Gelaye, 1990).

2.3.3. Nutrition

The effects of nutrition on reproduction are well known and widely reported. Conversely, food availability or even some increase in nutrient availability can be the proximate factor triggering breeding activity, the nutrition has an influence on the breeding seasonal is much weaker in the originated breeds from temperate latitudes than in originated breeds from the mediterranean or tropical weather (Boukhliq et al., 1996; Zarazaga et al, 2005).

We well know between the reproduction and nutrition there is an interaction and that has a significant effect on the reproductive ewes performance, undernourishment leading in the loss weight of body and condition of the body that's lead to delays the starts of puberty, increases the after birth interval to conception, decreasing secretion of the gonadotropin and increase in the prolificacy that gets by interaction with normal ovarian cyclicity (Robinson, 1996; Boland et al., 2001; Nottle et al., 1997).

Many studies conducted on the nutrition-folliculogenesis-ovulation rate interactions in ewes have been field studies where interpretation of specific nutritional conditions affecting ovulation rate has been precluded due to the complex and often undefined nature of diets consumed, however, nourishment influence is generally described well, the mechanisms physiological that underlie these influences are understood poorly, so at this time, the whole comprehension of how and the time of nourishment influences rate of ovulation will simplify the application of aim nourishment in production sheep systems improve reproduction, and may supply approach alternative to reproduction management in the system of a commercial that does not rely on the use of exogenous hormones (Scaramuzzi & Martin, 2008).

The nourishment influences on animal reproduction, mostly studies of sheep, are reported widely and well known. nourishment exerts an important effect on the function of reproductive via changes in the weight of the body and condition of the body that leads to an influence on the development of the follicular and rate

of the ovulation (Lindsay et al., 1993;Scaramuzzi & Martin, 2008; Scaramuzzi et al., 2006).

The supplement nutritional has an influence on the folliculogenesis stages to some extent, the effect on the chose of follicles dominant, increasing growth and diameter of follicular and development the quality of the oocytes (Lucy, 2003; Scaramuzzi et al., 2011;Garnsworthy et al., 2004).

These changes in the development of the follicular are promoting via with high-energy and/or high- protein diets supplementation (Teleni et al., 1989).

Considered the high pre-weaning mortality of young kids is one of the most important production factors that adversely affect goats (Devendra & Burns, 1970).

Goats rearing under communal farming situation are characterized by percentages of low weaning and high kid mortality (Slayi et al., 2014; Peacock, 1996).

Implicated severals predisposing on mortality of kid factors that have colostrum lack, mothering poorly, poor nourishment of the doe leading to low production of milk, lack of hygiene permit an accumulation of agents infective, and water contaminated (Kyomo, 1978; Mchau, 1979; Sarmah et al., 1981).

Reported that the preweaning period the percentage for mortality was high, animals younger appear less able to resist both biological and physical invasion agents due to their immunity lack. This leading them to increase susceptibility to infection intestinal and respiratory (Ndamukong, 1985).

The system traditional of management goat is at mostly characterized by survivability low and the mortalities of kids is high, that's leading to the low in percentages weaning (Sebei et al., 2004).

Reported in the humid zone the higher mortality of 40 to 50% contrasts with the low mortality rate (Reynolds et al., 1988).

This portion may be due to the small package of a veterinary provided in this project which developed the survival of flock. Slow growth among those that

survive and high mortality among kids is the main constraint to production. Mortality of goat found out to be the most important constraint, in addition, numbers of farmers with fewer numbers of goats are unable to sustain their flocks, and due to high rates of goats mortality do not realize the potential benefits from larger flocks (Homann et al., 2007).

2.4. β-Carotene ‘n Animal Nutrition

2.4.1. β-Carotene Structure

BC is an essential precursor to vitamin A (vit A), that belongs to the carotenoids family, carotenoids are biosynthesized by higher plants, algae, bacteria, and yeasts which are natural colored pigments (Namitha & Negi, 2010; Lado & Gore, 2016)**.**

There are more than 6 thousand feature structurally for carotenoids, and rely on their structure are distributed into two categories, carotenes that include hydrocarbons only and these contain BC, α-carotenoids, and lycopene xanthophylls which involve oxygen and hydrocarbons, like zeaxanthin and lutein (McDowell, 2000; Namitha & Negi, 2010; Gore**,** 2016).

Carotenoids play an important role in the communication intercellular and have immune functions because it is an antioxidant (Skibsted, 2012;Stephensen, 2013; Gore**,** 2016).

Nevertheless, the animals aren't able to the formation of carotenoids denovo, they depend on the nutrition to equipping these compounds of pro-vitamin A (Biesalski et al., 2007; Lado & Gore**,** 2016). BC is a sub-group of carotenes with a chemical formula C40H56.

2.4.2. β-Carotene Conversion

BC such as another carotenoid is mostly turning into A vit in the mucosa of intestinal as well as in the liver and another tissue in the body (Borel et al., 2005; McDowell, 2000; Lado & Gore **,** 2016).

The process of conversion BC to vitamin A is BC, BC 15, 15´-monooxygenase that divides BC molecule through the central split and BC, BC 9´, 10´-dioxygenase which splits through cleavage of eccentric, this process done by enzymes, BC is turned in the retinal into 2 molecules during cleavage central, and through cleavage eccentric into 1 molecule each of BC -apo- carotenal and BC – ionone (Biesalski et al., 2007).

2.4.3. β-Carotene Functions

Consider the main function of BC is that of being the precursor of vit A, nevertheless, there are functions for the BC independently of provitamin A, BC involved in scavenging both singlet molecular oxygen and peroxyl radicals because of the BC are a antioxidants (Ramadan et al., 2003).

The BC play a role in the immune system in the different animals because shown help the body defense system (Chew, 1987; Lado & Gore **,** 2016).

The BC stimulated the thymus gland growth and increased the thymic small lymphocytes number and has an improves the reproductive processes. However, it was aforementioned that supplementation of the BC may elevate killing phagocytic cells ability in the blood of bovine and mammary gland through the period of peripartum (Daniel et al., 1991).

2.4.4. Effect of B-Carotene on Reproduction

The major component of economic success in the dairy flock is reproductive efficiency, it was reported that the concentrations plasma of vit A and BC have useful influences on reproduction (Aslan et al., 1998; Hoagland et al., 1988) (Haliloglu et al., 2002).

The deficiency of vit A and BC leading to extended of the oestrus duration, cysts ovarian that result in depressed rates conception and early pregnancy abortions (Jukola et al., 1996; Pethes et al., 1985).

Was reported the BC deficiency has an effect on the decrease of the external signs of estrus and fertility in cows, in the species ruminant has been reported the BC supplementation has improved on the reproductive performance (Aréchiga et al.,1998).

Nevertheless, the effect of BC supplementation on ovarian activity and fertility in ruminants have reported by several studies but the result was varying, other studies detect, over there decreased the number of cows with dysfunctions ovarian, days to the first service, and days open, with increasing BC concentrations in the body (Failing et al., 1998).

In the addendum to that rates of embryonic mortality and early abortion being high when the cows have a BC deficiency in their body, has been found to increase reproductive performance when given supplementation of the BC either antepartum and postpartum or only postpartum, measured as conception rate or days of the first service (Hye et al., 2020).

Moreover, proof for the specific role for the carotene in reproduction arranging (Chew, 1987), there have been several reports of improved reproductive performance in both dairy heifers and lactating cows provided supplemental carotene even when dietary a was adequate, in the end, there is important nutrition and nutritional supplements for the animal, sometimes it has an effect and sometimes it does not have that depends on the type of animal and on the genes, environment, and management of the animal.

2.5. Vitamin E and Its Implication in Animal Nutrition

2.5.1. Vitamin E Structure

Historically defamed over the years' vitamin E (vit E) has multiplicity structures, there are in nature eight compounds four tocotrienols (a, jS, 7, and 6) and four tocopherols (a, /5, y, and S), it was isolated. chroman-6-ol is the chemical full name for a-tocopherol is 2, 5, 7, 8-tetramethyl-2-(4', 8', 12'-trimethyl-tridecyl). (lUNS Committee on Nomenclature, 1978; Domingo Carrion Pardo,1995).

In the end total result mixture synthetic of the four possible enantiomeric pairs of the eight diastereomers (Ullrey, 1981).

From the extraction of natural tocopherols from vegetable oils the d-a-tocopheryl acetate that's results. Those tocopherols natural are then acetylated to produce the ester (Lynch, 1991).

2.5.2. Vitamin E Conversion

The oxidative conversion of tocopherol to tocopheroxy-radical is the first stage of vit E biotransformation, in addition, the radical intermediate oxidate is unidirectional and produces in tocopheryl-quinone by a reversible reaction, in a reversible reaction, the toopheropher-hydroquinone can reduced by tocopheryl-quinone, whole the metabolites of quinone have a few activities of vit E. The tocopheryl-quinone conjugate for excretion in bile by the liver (Bjørneboe et al., 1987).

That was observed, after 24 hours from injection venous of rats by the dl-a-['H] tocopherol 14% of the radioactivity in the bile was found, and that single a portion an-tocopherol was unchanged. just 3% of the whole radioactivity in the bile was found unchanged tocopherol had identified, that was observed in the sheep (Hidiroglou & Ivan, 1992).

2.5.3. Vitamin E Functions

The E vit plays a role in the integrity, and the essential action of the muscular, circulatory, reproductive, immune, nervous systems The biological antioxidant when the phenolic hydroxyl of its chromanol ring is free the most important function of vit E (unesterified), can function as a scavenger of free radicals the free hydroxyl at the sixth position of the chroman, the free hydroxyl at the 6th design of the circle chroman can work same a scavenger of free radicals, generally being oxidized to the quinone or semiquinone, however, can be protected the active group oxidation by esterification with the group of carboxyl organic

acids forming esters like the succinate derivatives or acetate, the esters haven't the activity of antioxidant (L. McDowell, 1989; Ullrey, 1981).

2.5.4. Effect of Vitamin E on Reproduction

The relationship between nourishment and physiology has played a key role in the performance of goat and that minerals nutrition has an important role too, has shown in the new researches, the most two important categories in breeding animals are the nutritional situation through gestation and the proper growth rate of lambs in early life and before puberty (Castro et al., 2011).

Vit E enhances body immunity metabolism and reproduction for the pig, so that consider as an essential nutrient that should be included in diets of its (McDowell et al., 2002; Umesiobi, 2009).

That was observed an increase in litter size and a reduction of pre-weaning piglet mortality when dietary vit E intake during gestation or intramuscular injection of vit E (Allan & Bilkei, 2005).

Addendum to that improves E vit the semen quality and spermatogenesis (Marin-Guzman et al., 2000; Wallock et al., 2001) and maybe fertilization female oocytes (Umesiobi, 2009).

Nevertheless, the most favorable level of vit E that necessary to get better the reproductive system function in pigs appear to be quite variable, generally because of several factors like the diet composition, consumption of feed (Umesiobi, 2009) rate of growth (McDowell et al., 2002).

And stress or conditions of the husbandry. that exerts several effects on the litter size and rate of conception, deficiency of E vit was observed to influence on the improvement of the growth and status of health for the weanling pigs (Flachowsky, 2000), (McDowell et al., 2002) cattle and many different animal types (McDowell et al., 2002; Pehrson et al,. 2001).

To prevent reproductive failures during gestation and lactation required dietary supplementation of E vit. (McDowell et al., 2002; Wolf, 2005);(Umesiobi, 2008).

2.6. Selenium in Animal Nutrition

2.6.1. Selenium Structure

In 1817 was discovered the Selenium (Se) by Jöns Jakob Berzelius**,** It has an atomic mass of 78.96 and a number atomic of 34 (Lide, 2004).

When classified the element Selenium as non-metallic, and with sulfur sharing similar chemical properties, so consequence that it can oftentimes replace sulfur (Barceloux, 1999).

The essential component to form the active center is Se (selenol group, SeH) of peroxidase glutathione, reductase of thioredoxin and other selenoenzymes. (Ganther, 1999; Levander, 1987).

The selenite and selenate are common inorganic forms of Se, while selenocysteine (SeCys) and predominately selenomethionine (SeMet) its organic forms (Barceloux, 1999).

Elemental Se bound to fly ash and particles is the most of the Se presents in such this form, with average concentrations among 0.1-10 ng Se/m3 (Barceloux, 1999).

In water, selenate and selenite ions are the primary water-soluble forms of Se (Tsuji et al., 2011).

2.6.2. Selenium Conversion

Through the replacement of methionine can be readily incorporated SeMet into protein (Fairweather-Tait et al., 2010).

Can be transformed both forms ingested inorganic and organic of Se to the mutual intermediate, selenide (Suzuki, 2005).

Simply can reduce the selenite and selenate to selenide, while the SeCys lysed to selenide directly, finally before lysed to selenide the SeMet is transform to SeCys (Suzuki, 2005).

Se is either used for the synthesis of selenoproteins or excreted after entering the selenide pool to the body (Fairweather-Tait et al., 2010).

The metabolism of inorganic and organic forms Se has been attributed to the utilization of organic form (Swanson et al., 1991).

As a result of recycling Se organic, so inorganic Se forms Seems to be less keep in the body than the organic form (Burk et al., 2006; Schrauzer, 2000).

2.6.3. Selenium Functions

Now known the Se is as primary nourishment needed by each organisms living (Burk et al., 2006; Kieliszek & Błażejak, 2013).

Its found in twenty-five identified selenoproteins with different functions biological (Kryukov et al., 2003;Tait et al., 2010).

The antioxidant properties it's the greatest biological significance for the Se, that keep safe the organism from damage oxidative (Arteel & Sies, 2001; Rotruck et al., 1973).

2.6.4. Effect of Selenium on Reproduction

Se has an important role in antioxidants so it considers one of the elements with a wide range of functionalities in the body, and ingress to the significant compounds such as several selenoproteins, one of the methods for improving the production and reproductive conditions of livestock is through utilizing enhancers of metabolic by optimizing the metabolism of nutrients and remove or decrease the condition of stress, enhancers of metabolic, such as somatotropin, anabolic steroids, beta-agonists, minerals, and vitamins that are fed to increase the rate of growth, the levels of supranational, increase the production of meat, improve feed efficiency, reduce carcass fat and optimize reproductive performance. In addition

to that's considered one of the most vital metabolic enhancers is mineral substances such as iodine and selenium as primary micronutrients for several functions of the body in livestock (Hernández-García et al., 2015; Sevcikova et al., 2011).

Tested the influence of forms selenium inorganic and organic that was given for goats pregnant on parameters of blood and Se concentration in blood and urine, that was enough to stop deficiency of selenium in the kids at the weaning time (Kendall et al., 2012).

As well as that utilize pellets has slow-release that include selenium, cobalt, and copper optimize the sheep performance. deficiency of selenium has an effect on several economically significant diseases of livestock, trouble that involves abortion, impaired fertility, neonatal weakness, and placenta retention (McDowell et al., 1996).

In the end, the giving of selenium daily leads to optimizing the gain weight and reproductive performance in ewes (Gabryszuk & Klewiec, 2002;
Mackenzie, & Telfer, 2012).

3. MATERIAL AND METHODS

3.1. Materıal

3.1.1. Study Area

The experiment was occurred at conducted research and implementation farm of Faculty of Agriculture at the Çukurova University-Adana, in southern Turkey, the effect of the mediterranean climate, which is dry and hot in summer and mild and rainy in winter, is observed in the region. It has a structure designed to prevent northern winds and protection from rain by considering the aggressive climate characteristics, in addition, it has a feature that is planned to ensure that the animals are affected by the high temperature, which affects the summer at a minimum level, thanks to its porch .

3.1.2. Animal Samples Sites

Collection animal samples, the animal samples were randomly collected from animal field Adana during the season of 2019, and after collection of the goats, they were injection (IM) the elements (B-carotene and Vitamin E + selenium).

3.2. Methods

3.2.1. Experimental Design and Treatments

Eighty female goats were allocated into one of the following four groups and stable per group based on their age and parity during the breeding season, Group A (β-carotene supplemented / n=20), we have injected every animal (5ml/goat /weekly), group B (Vit E+selenium / n=20), we have given every animal (5ml/goat /weekly), group C(β- carotene and Vit E-selenium / n=20)(2,5ml β-carotene, 2,5ml Vit E+selenium) have given every animal (5ml/goat /weekly) and group D control (n=20). This experiment was continued for four weeks.

3.2.2. Food of Animal

Nutrition is an important and essential factor in the fertilization process for animals, so the nutrition is one of the important factors in animal husbandry, so we have to take care of this process, each animal has been given approximately 1kg feed mill plus 2kg silage every day. Food consists of a group of important vitamins and vitamins for animals, the table below shows the food ingredients.

Analysis Values	*Vitamin*	*Trace elements*
Protein 16%	Vit A 9,000 IU/kg	Cu 10mg/kg
Oil 3.5%	VIT D3 2,500 IU/kg	İodine 1mg/kg
Ash 7%	Selenium 0,15 MG/kg	Co 0,15mg/kg
Cellulose 10.5%		Fe 30 MG
Sodium 0,3 %		ZN 70mg/kg Mn 50mg/kg

3.3. Statistical Analysis

The obtained data were evaluated and interpreted statistically in order to comply with the aimed objectives and approaches and the success of the project. SPSS computer package program was used to analyze the data for ANOVA.

In the research, fertility criteria were calculated as follows.

Fertility rate (%) = Number of goats giving birth / number of goats joined x100

Litter size = Number of kids born / number of goats kidding x 100

Fecundity rate = Numbere of goats born/number of goats joined mated x 100

Twinning rate (%) = Number of sheep giving birth to twins / number of sheep giving birth x100

$Yijk = \mu + e_i + b_{(j)} + + eijk$

Yijk = Each feature is worth the wait

μ = Average population

e_i = The effect of the genotype (i = 1,2: ALPIN, SAANEN)

b_j = The supplement (β-Carotene , VITAMEN E- selenium)

e_{jk} = The effect of error.

4. RESULTS AND DISCUSSION

In this experiment, in the table (4.1) and (4.2) we had been used some of elements beta carotene vitamin E-Selenium, and we took two different genotypes of goats (Alpine and Saanen). The number of goats was 80, each and every variety consisted of 40 animals. These animals were divided into four groups, of each group containing 20 animals, the first group of animals was injected with (Beta-carotene/5ml) and the second with (vitamin E selenium/5ml). The third was injected with a mixture of (Beta/ 2.5 and Vit E-S/2.5). The fourth group was control.

Table 4.1. Fertility Traits of Alpine

TREATMENT	β	E-S	β +E-S	C	T
Total number of goats	10	10	10	10	40
Number of breeding goats	9	10	9	10	38
Infertility	1	0	1	0	2
The number of kids born alive	14	15	16	17	62
Single birth	4	5	2	3	14
Twinning birth	5	5	7	7	24
Birth rate (%)	90	100	90	100	95
Infertility rate (%)	10	0	10	0	5
Litter size rate (%)	155.55	150	177.77	170	163.15
Fecundity rate (%)	140	150	160	170	155.55
Single birth rate (%)	44.44	50	22.22	30	36.84
Twinning rate (%)	55.55	50	77.77	70	63.15

Table 4.2. Fertility Traits of Saanen Goats

TREATMENT	β	E-S	β +E-S	C	T
Total number of goats	10	10	10	10	40
Number of breeding goats	8	8	8	6	30
Infertility	2	2	2	4	10
The number of kids born alive	12	15	13	8	48
Single birth	4	1	3	4	12
Twinning birth	4	7	5	2	18
Number of Triplets	0	0	0	0	0
Birth rate (%)	80	80	80	60	75
Infertility rate (%)	20	20	20	40	25
Litter size (%)	150	187.50	162.50	133.33	160
Fecundity (%)	120	150	130	80	120
Single birth rate (%)	50	12.5	37.50	66.66	40
Twinning rate (%)	50	87.50	62.50	33.33	60

Table 4.3. Fertility Traits of Saanen and Alpin Goats

TREATMENT	β	E-S	β +E-S	C	T
Total number of goats	20	20	20	20	80
Number of breeding goats	17	18	17	16	68
Infertility	3	2	3	4	12
The number of kids born alive	26	30	29	25	110
Single birth	8	6	5	7	26
Twinning birth	9	12	12	9	42
Birth rate (%)	85	90	85	80	85
Infertility rate (%)	15	10	15	20	15
Litter size rate (%)	152.94	166.66	170.58	156.25	161.76
Fecundity rate (%)	130	150	145	125	137.50
Single birth rate (%)	47.05	33.33	29.41	43.75	38.23
Twinning rate (%)	52.94	66.66	70.58	56.25	61.76

Table 4.4. Effects of supplements on perfotmance parameters (Alpine)

	Litter Size	p	Fecundity	p	Birth Rate	p	Twinning rate	p
β +V - β	177.77-155.55	P<0.05	160-140	P<0.05	90 – 90	P<0.05	77.77 – 55.55	P<0.05
B-V	155.55–150.0	P<0.05	140–150	P<0.05	90 – 100	P<0.05	55.55 – 50.0	P<0.05
β +V - C	177.77 – 170.0	P<0.05	160–170	P<0.05	90 – 100	P<0.05	77.77 – 70.0	P<0.05
β - C	155.55–170.0	P<0.05	140–170	P<0.05	90 – 100	P<0.05	55.55 – 70.0	P<0.05
V - C	150.00–170.0	P<0.05	150–170	P<0.05	100 – 100	P<0.05	50.0 – 70.00	P<0.05
β +V - V	177.77–150.0	P<0.05	160–150	P<0.05	90 – 100	P<0.05	77.77- 50.00	P<0.05

β = beta carotene , V = vitamin E-Selenium , β+V = beta carotene&E-Selenium, C= control

In table 4.4. showed the effects of the supplements on theses parameters (birth rate, litter size, fecundity, and twining rate) we noticed no positive effects from these supplements on the Alpine genotype, we have known nutrients important for the body and maybe sometimes play an essential role on the reproductive performance of animals, so might the physiological process, bioavailability and the absorption process of this supplements from this genotype had led to these results, and might these supplements didn't effect on the ovarian activity and hormones of reproductive system that's important on the that's important on the ovulation.

Table 4.5. Effects of supplements on performance parameters (Saanen)

	Litter Size	p	Fecundity	p	Birth Rate	p	Twinning rate	p
β +V - β	160.50 – 150.0	P>0.039*	130 – 120	P<0.05	80 – 80	P<0.05	62.50 – 50.0	P<0.05
β -V	150.0 – 187.50	P<0.05	120 – 150	P<0.05	80 – 80	P<0.05	50.0 – 87.50	P<0.05
β +V - C	162.50 – 133.33	P<0.05	130 – 80.0	P>0.005*	80 – 60	P<0.05	62.50 – 33.33	P<0.05
β - C	150.0 – 133.33	P<0.05	120 – 80.0	P<0.05	80 – 60	P<0.05	50.0 – 33.33	P<0.05
V - C	187.50 – 133.33	P>0.002*	150 – 80.0	P>0.000*	80 – 60	P<0.05	87.50 – 33.33	P<0.05
β +V - V	162.50 – 187.50	P<0.05	130 – 150	P>0.001*	80 – 80	P<0.05	62.50 – 87.50	P<0.05

β = beta carotene , V = vitamin E-Selenium , β+V = beta carotene&E-Selenium, C= control

In table 4.5. Saanen genotype, showed the effects of the supplements on theses parameters (birth rate, litter size, fecundity, and twining rate) we noticed a negative effect in some groups but there is a positive effect from another's from these supplements, there is no effect from the beta carotene on the fecundity rate, Im agree with the (Kaewlamun, 2010) that said the carotene has negative effect on the ovarian activity, might the carotene didn't improve the reproductive system and had a negative effect on the GnRH that responsible to stimulating realasing of two hormonse (FSH) and (LH), the FSH stimulate follicle growth and LH stimulate ovulation so might from these reason did lead to had negative on the fecundity, but we noted the effect of vitamin E+Selenium and the mixture of (beta carotene with E+Selenium) on the fecundity and litter size, I agree with (Sterndale et al. 2018) that said supplementation with Vit E and Se can improve reproductive performance, and growth performance of goats, might the

Vit E are necessary for growth and fecundity in animals and for prevention of various disease conditions, might the Vit E did improve the reproductive activity especially the ovarian, might have a positive effect on the central nervous system that important to receives information from the environment of the animal and after that conveys this information to important two organs the hypothalamus and the pituitary gland that's responsible for the secretion of the important hormones, as for the mixture of the supplements I'm agree with (Arechiga *et al*., 1998) and (Abdel-Raheem, Sherief, et al.2019) the first researcher said the β- carotene improve the performance, and the second said the supplements of vit E+Selenium improve the growth performace, might the mixture of β-carotene and vitamin e-selenium did lead to the stimulation of the hormones to increase the ovarian activity and might provide a suitable uterine medium for implantation and embryo development via the antioxidant activity.

Table 4.6. The effect of the supplement (Beta carotene +Vitamin E+Selenium) on the birth rates

Groups	*No.of goats mating*	*No.of goats breeding*	*Birth rate %*	*Significant*
β *+V-* β	20 - 20	17 – 17	%85 - % 85	P < 1,700
β *-V*	20 - 20	17 – 18	%85 - % 90	P < 0,705
β *+V-C*	20 - 20	17 – 16	%85 - % 80	P < 0,697
β *- C*	20 - 20	17 – 16	%85 - % 80	P < 0,697
V-C	20 - 20	18 – 16	%90 - % 80	P < 0,443
β *+V-V*	20 - 20	17 - 18	%85 - % 90	P < 0,705

β = beta carotene , V = vitamin E-Selenium, β+V = beta carotene&E-Selenium , C= control

In Table 4.4. we had compared between the group and showed the effect of supplement on the birth rates, we compared between the mixture of the (beta carotene + vitamin E+Selenium)(beta carotene) we had observed (P<1,700)

insignificant, (beta carotene)(vitamin E+Selenium) with (P<0,705) insignificant, mixure of (beta carotene +vitamin E+Selenium) (control) with (P > 0,697) , (beta carotene) and (control) with (P < 0,697) insignificant,(vitamin E+Selenium) (control) with (P > 0,443) insignificant and the mixture of the (beta carotene + vitamin E+Selenium) (vitamin E+Selenium) with (P < 0,705) insignificant**.**

The useful effects of nourishment on reproduction are well known, we had in all these comparisons from these supplements a negative significant on the birth rates, about the beta-carotene I agree with (Dominic Lado Marino Gore, 2016) that said there is no effect from the beta carotene on the reproductive performance, although there are some researchers said that there is an effect from beta on the performance of goats, might this supplement no effect on follicles number, size of follicles, and size of the corpus luteum, the response to oestrus, oestrus onset - duration, rate of conception, and might don't improve the ovarian activity of the female that did lead to no positive effect on the birth rate from carotene, and about the vit E + Selenium I not agree with (Gabryszuk & Klewiec, 2002) he said there is an effect from these supplement on the performance , might didn't improvement estrus response, fertility, and ovulation following administration of vitamin E and Selenium, we know the ovulation occurs under the influence of LH released from the pituitary gland, might these supplements didn't increase of the ovulation by an increase released GnRH which turns to increase releases the FSH and LH.

Table 4.7. The effect of the supplement (Beta carotene +Vitamin E-Selenium) on the litter size

Groups	*No.of kids born*	*No.of goats breeding*	*Litte size %*	*Significant*
β *+V-* β	29-26	17 – 17	%170.58 –%152.94	P < 0,317
β *-V*	26-30	17 – 18	%152.94 -%166.66	P < 0,434
β *+V-C*	29-25	17 – 16	%170.58 -%156.20	P < 0,407
β *-C*	26-25	17 – 16	%152.94-%1156.20	P < 0,804
V-C	29-25	18 – 16	%166.66 -%156.20	P < 0,541
β *+V-V*	29-30	17 - 18	%170.58- %166.66	P < 0,820

β = beta carotene , V = vitamin E-Selenium, β+V = beta carotene&E-Selenium , C= control

In Table 4.4. we had compared between the group and showed the effect of supplement on the birth rates ,we compared between the mixture of the (beta carotene + vitamin E+Selenium)(beta carotene) we had observed (P<0,317) significant, (beta carotene)(vitamin E+Selenium) with (P<0,434) insignificant, mixure of (beta carotene +vitamin E+Selenium) (control) with (P<0,407) , (beta carotene) and (control) with (P <0,804) insignificant, (vitamin E+Selenium) (control) with (P<0,541) insignificant and the mixture of the (beta carotene + vitamin E+Selenium) (vitamin E+Selenium) with (P<0,820) insignificant.

The useful effects of nourishment on reproduction are well known, we had in all these comparisons from these supplements a negative significant on the litter size, I agree with (Gore, 2016) that said there is no effect from the beta carotene on the litter size, and I agree with (Babinszky et al.1992 ; Siddig ,2014) the tow researchers that said there is no effect from vitamin E on the performance, we know the ovulation rate partly determines the number of offspring that a female will ovulation rate is determined by the number of follicles that develop to the graafian stage, so might these supplement no effect on the ovulation that did lead showed a negative significant from these supplement on the litter size.

Table 4.8. The effect of the supplement (Beta carotene +Vitamin E-Selenium) on the fecundity

Groups	*No.of kids born*	*No.of goats breeding*	*Fecundity %*	*Significant*
β *+V-* β	29-26	17 – 17	%145 – %130	P < 0,366
β *-V*	26-30	17 – 18	%130 - %150	P < 0,232
β *+V-C*	29-25	17 – 16	%145 - %125	P < 0,224
β *-C*	26-25	17 – 16	%130 - %125	P < 0,754
V-C	29-25	18 – 16	%150 - %125	P < 0,132
β *+V-V*	29-30	17 - 18	%145 - %150	P < 0,771

β = beta carotene , V = vitamin E-Selenium, β+V = beta carotene&E-Selenium , C= control

In Table 4.4. we had compared between the group and showed the effect of supplement on the birth rates, we compared between the mixture of the (beta carotene+vitaminE+Selenium)(beta-carotene) we had observed (**P<0,366**) significant, (beta carotene)(vitamin E+Selenium) with (**P<0,232**) insignificant, mixure of (beta carotene +vitamin E+Selenium) (control) with (**P<0,224**), (beta carotene) and (control) with (**P<0,754**) insignificant, (vitamin E+Selenium) (control) with (**P<0,132**) insignificant and the mixture of the (beta carotene + vitamin E+Selenium) (vitamin E+Selenium) with (**P<0,771**) insignificant, might these supplements didn't effect on the ovulation, time on the ovulation and on the important hormones in the reproductive system.

Table 4.9. The effect of the supplement (Beta carotene +Vitamin E-Selenium) twining rate

Groups	No.of breedıng goats	No.of goats of goats twin breeding	Twin rate %	Significant
β *+V-* β	17 – 17	12 – 9	%70.58 - %52.94	P < 0.106
β *-V*	17 – 18	9 - 12	%52.94 - %66.66	P < 0,201
β *+V-C*	17 – 16	12 – 9	%70.58 - %56.25	P < 0,183
β *-C*	17 – 16	9 - 9	%52.94 - %56.25	P < 0,774
V-C	18 – 16	12 - 9	%66.66 – %56.25	P < 0,321
β *+V-V*	17 - 18	12 - 12	%70.58 - %66.66	P < 0.733
β = *beta carotene , V = vitamin E-Selenium, β+V = beta carotene&E-Selenium ,C= control*				

In Table 4.4. we had compared between the group and showed the effect of supplement on the birth rates, we compared between the mixture of the (beta carotene + vitamin E+Selenium)(beta carotene) we had observed (**P<0.106**) nonsignificant, (beta carotene)(vitamin E+Selenium) with (**P<0,201**) nonsignificant, mixure of (beta carotene +vitamin E+Selenium) (control) with (**P<0,183**), (beta carotene) and (control) with (**P<0,774**) nonsignificant, (vitamin E+Selenium) (control) with (**P<0,321**) nonsignificant and the mixture of the (beta carotene + vitamin E+Selenium) (vitamin E+Selenium) with (**P<0,733**) nonsignificant**,** this supplements might effect on the reproductive performance and increase from activity of its but didn't effect on the number of the twining, and might this supplements have negative effect on the FSH that responsible to make the superovulation.

Table 4.10. Effects of supplements on the kids of body weight

	Alpine		Saanen		
	N	**Mean weight**	**N**	**Mean weight**	**p**
β	14	3.969	12	3.770	0,400
V	15	4.185	15	3.971	0,015*
β +V	16	3.861	13	3.790	0,088
C	17	4.146	8	4.350	0,063
T	62	4.087	48	3.939	0,400

β = *beta carotene ,V = vitamin E-Selenium,β+V = beta carotene&E-Selenium ,C= control*

We showed in the 4.10. table the effect of supplement on the body weight of kids, we showed there is no effect from the (Beta-carotene) and the mixture of the beta-carotene with vitamin E+Selenium) except the vit E+Selenium we showed a positive effected, as for the beta-carotene I'm agree with (Arellano- Rodriguez et al., 2007; Meza-Herrera et al., 2011; Meza-Herrera et al., 2013ab) that were said there β-carotene has no positive effect on the body weight in goats, might the rumen bacteria function and cellulose digestion improved by the carotene. That leads to excretion of it out the body and doesn't affect the weight, (Hino et al., 1993) said the supplement of carotene improves the rumen bacteria function. However, (McDonald, 2000) said that absorption of carotene in the mammalian species differs between them, the intestine of the cattle and horses absorbs the carotene more than intestine of the sheep, goats and rabbits so might that lead to excretion the supplement out the body and doesn't accumulation in the tissues and therefore the carotene doesn't affect on the bodyweight of the kids.

As for the vitamin E+Selenium I'm agree with Im agree with (Koyuncu & Yerlikaya., 2007) in thier study there is a positive effect from vitamin E selenium on the birth weight, as this element plays an important role in many other physiological processes and metabolism in goats and might important for the

pregnancy, might the vitamin E+Selenium stored in many tissues in the body such adipose tissue, liver and muscle and is concentrated in the cell membrane fractions such as those of the mitochondria and microsome that's lead to increase the body weight of the kids, (Mehlert & Diplock.,1985) they said Vitamin E is stored in many tissues in the body, and as for the mixture of these supplements didn't effect on the body weight because the mechanism of carotene worked against of vitamin E+Selenium mechanism that's did lead to showed a negative affect from this mixture.

5.CONCLUSION

Goats have a set of characteristics and high adaptability in different environmental conditions around the world. For this reason, the world is moving to raising goats in the livestock sector. It is known that Turkey is one of the leading countries in the world in terms of raising goats and has the ability to increase production and livestock through improvement efforts made by workers in this sector as well due to climatic conditions, protection and nutrition provided to animals, in general the demand for animal products increases rapidly because of the population increase occurring in countries, especially in developing countries. In order to meet the increasing demand for animal products, countries tend to increase and improve this sector continuously because it is important from the economic point of view of the country and improving their financial situation and the more operations they increase good management of this sector as production increases, companies working in this sector (livestock) are making intense efforts to increase the number of goats by increasing the fertility and reproductive performance of mothers to increase the number of lambs. One of the methods used to increase fertility and reproductive performance among mothers is nutrition, because nutrition plays an effective role in increasing fertility and reproductive performance, but not all elements give good and effective results on fertility and reproductive performance. There are elements that are not related to increasing these properties, which leads to a loss of money and wasted a lot of time and may lead to animal damage.

In this experiment, we used three elements, which are (beta-carotene) (vitamin E) and (Selenium) on a group of goats. It has been shown in the results that beta works negatively on the weight of animals, because it activates the bacteria digesting in the stomach, which leads to increased excretion of substances from the body and not stored in the body as for vitamin E-Selenium, it has been observed in the results that it leads to an increase in body weight, because it is

important for the body and also is stored in the tissues of the body. As for the mixture that we used for animals, it does not affect the increase in weight, as for the parameter in reproductive performance and fertility, beta-carotene, according to the results, does not affect these properties. As for vitamin E, it affects these properties in an excellent way. As for the mixture between these two elements (beta-carotene and vitamin E-Selenium), it affects, but not as much as the effect of vitamin E-Selenium.

The advice provided to companies working in this sector, as well as for breeders, is that the use of vitamin E-Selenium is important to increase the weight of animals as well as to increase fertility and reproductive performance and thus increase production and animal wealth. Either the use of beta-carotene or beta-carotene with a mixture of the vitamin E-Selenium has no effect on the animal and that its use leads to losses in money and time, moreover, studies should be conducted evaluating the influence of different levels of vitamin E+Selenium and β- carotene on the performance of productive goats, vitamin E+Selenium and β-carotene concentration in tissues of animals can also be influence by season, as such future studies should also be conducted in different seasons of the year.

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