



An Important Genetic Material for the Turkish Goat Production: The Maltese Goat

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ABSTRACT

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As is clearly understood from its name, the origin of Maltese goats come from Malta Island. Different information exist about past of the Maltese goats. Numbers of the goats that had been brought to our country long time ago are in the critical threshold. In this study, some of the morphologic and other characteristics of the genotype of Maltese goats which have been husbandred in the experimental farm of Çanakkale Onsekiz Mart University has been meticulously investigated. While almost all the colors are observed in Maltese goats, black mottled and red mottled are the dominant ones. The goats with long, broad and baggy ears from the middle, are mostly hornless. In some individual of the genotype which have weak breast connection to the body, excessive baggy breast have been observed. Just as Maltese goats share similarity with goat of Damascus and Kilis in terms of body size, they look like goats of Kilis, Damascus, Hair, Norduz and Honamlı in terms of live weights. Maltese goats are quite promising with regard to kid production because of high level of litter size (2.4 kid/goat), growing ability of kids (123-209 g/day) and distinction of health features. Besides efficient milk yield (108-539 kg/lactation) they have considerably good level of milk protein and milk fat. As conclusion, the Maltese goat breed is a good alternative for semi-extensive production conditions.

Türkiye Keçi Yetiştiriciliği İçin Önemli Bir Değer: Malta (Maltız) Keçisi

MAKALE BİLGİSİ

ÖZET

Derleme

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Malta keçisi isminden de anlaşılacağı üzere Malta Adasından köken almaktadır. Malta keçisinin geçmişiyle ilgili farklı bilgiler bulunmaktadır. Uzun yıllar önce ülkemize getirilen Malta keçisinin sayısal varlığı kritik eşiكتedir. Bu çalışmada, Çanakkale Onsekiz Mart Üniversitesi bünyesinde iki yıl süreyle barındırılan Malta keçilerinden elde edilen ve literatürden derlenen bilgiler ışığında, genotipin bazı morfolojik ve verim özellikleri irdelenmiştir. Neredeyse tüm renklere rastlanan Malta keçilerinde siyah alaca ve kırmızı alaca baskın

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Anahtar Kelimeler

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renklerdir. Uzun, geniş ve ortadan sarkık kulakları olan bu keçilerde, boynuzsuz hayvanlar çoğunlukta olmakla birlikte boynuzlu hayvanlara da rastlanmaktadır. Memenin vücuda bağlantısı zayıf olan genotipin bazı bireylerinde aşırı sarkık memelere rastlanmaktadır. Farklı yaş ve cinsiyetteki Malta keçilerinde belirlenen vücut ölçüleriyle Şam ve Kilis keçilerine, canlı ağırlıkları bakımından Kilis, Şam, Kıl, Norduz ve Honamlı keçilerine benzerlik gösterdiği söylenebilir. Malta keçilerinin yüksek düzeydeki oğlak verimi (2.4 oğlak/keçi), oğlakların büyüme yetenekleri (123-209 g/gün) ve sağlık özelliklerinin üstünlüğü açısından oğlak üretimi bakımından umut vaat etmektedir. İyi durumdaki süt veriminin (108-539 kg/laktasyon) yanında süt protein ve süt yağ oranı da oldukça iyi düzeydedir. Malta keçisinin saf yetiştiriciliğine ve gen kaynakları kapsamında korunmasına yönelik proje ve çalışmalara başlanmalıdır.

Introduction

The proportion of the world's livestock breeds classified as being at risk of extinction increased from 15 percent to 17 percent between 2005 and 2014 and a further 58 percent of breeds are classified as being of unknown risk status. It is reported that 7% of the genotypes of domestic animal species were extinct (FAO, 2015). 14 of 20 native cattle genotypes and 2 of 19 sheep genotypes found in Turkey were extinct and of the sheep genotypes, 11 are endangered. In addition, 3 of 5 native goat genotypes found in our country are endangered too (Ertuğrul et al., 2005). Savaş (1995) mentioned that the protection of still valid native genotypes was difficult under the socioeconomic conditions concerned and, therefore, it was important to put forward the reasons for protection soon in order to determine the genotypes which should be absolutely protected.

In Turkey, goat breeding generally takes place in the form of the cross-breeding of native goats with goats of a foreign genotype (Şengonca, 2001). Nevertheless, the yield potential of our native genotypes should be revealed with the studies, in which detailed environmental control is performed. Although it is stated that the kid and milk yield traits of Maltese goats are at good levels (Sönmez et al., 1973; Özder, 2006; Tölu et al., 2010; Tölu ve Savaş, 2012), these goats are endangered in our country (Ertuğrul et al., 2005). As also expressed by Tölu and Savaş (2008), Maltese goats should also be absolutely utilized in the goat husbandry of our country besides Hair, Angora, Kilis, Norduz, Honamlı, Gökçeada, Damascus goats and the goat genotypes formed by cross-breeding.

In this study, it is aimed to introduce the Maltese goat that has been particularly reared in Western Anatolia for long years and that is striking with some of its superior traits. In the study, some morphological and yield traits of the genotype were studied in the light of the observations obtained from the Maltese goats housed within Çanakkale Onsekiz Mart University for two years and in the light of the information collected from the literature.

Its Origin

As it will also be understood from its name, the Maltese goat, which is also called Maltese, in other words, of Malta, is supposed to have originated on the Malta Island. However, different reports on this matter are also striking. Özder (2006) states that the Maltese goat was formed as a result of efficient selection from the goats found on the Malta Island, while Blundell (1995) states that the genotype was brought from the Middle East and obtained as a result of selection from the local breeds on the island. On the other hand, it is reported that Maltese goats are a breed that originated in Italy and South Africa and that there are about 7000 heads in the southern sections of Italy (Carnicella et al., 2008). The Malta Island is a European Union country with an area of 316 km² in Southern Europe. Maltese goats were also taken to some Mediterranean countries, as to our country. The primary ones among these countries are Italy, Libya, Greece and Algeria (Özder, 2006). On the other hand, Bhattacharya (1980) states that the Maltese goat was obtained as a result of the cross-breeding of Nubian and Spanish Murcia goats and that the color is reddish brown and black-spotted and reports that the breed spread to the other countries from Greece and Turkey.

The earliest information about the production of the Maltese goat in our country belongs to Vetulani (1934) and the first information on its yield traits was put forward in 1971 (Sönmez et al., 1971). It is seen that the production of Maltese goats, which were brought to our country long years ago, particularly concentrated on the Aegean coasts and in Istanbul and its environment. The information on the Maltese goat first began to be produced on the goats that were brought to the pen at Ege University in 1964 (Sönmez et al., 1971). The Maltese goat is produced both in pure form and through cross-breeding with native and foreign breeds and its levels of yield are in good condition (Sönmez et al., 1971; Sönmez et al., 1973; Sönmez and Kaymakçı, 1974; Şengonca et al., 1978; Bhattacharya, 1980; Tölü, 2009a).

Body Sizes and Live Weight in Maltese Goats

Almost all colors are encountered in Maltese goats, although cream, black and red are dominant colors. Red & white and piebald goats are common. Hornless animals constitute the majority in these goats with long and wide (from time to time, animals which have ears with curling tips are encountered too) ears. The udder color might have different pigmentation according to the body color. The connection of the udder with the body is weak in these goats. Extremely drooping udders are encountered in some individuals (Figure 1; Tölü, 2009a).



Figure 1. Maltese goats and kids (by C.Tölu)
Şekil 1. Malta keçileri ve oğlakları

The values of body size which were obtained from the goats with different ages in the Maltese genotype are presented in Table 1. It is striking that the Maltese goats display fast growth until weaning although they are born small (Table 1). The values of live weight determined according to ages in Maltese goats are seen in Table 2. When the Maltese genotype was first brought to the unit (Goat Husbandry Unit at Çanakkale Onsekiz Mart University), the mean live weight of the goats (aged 2-6 years) was determined as 39.9 kg and, in the following period, their live weights increased by 6-7 kg on average (Tölu, 2009a).

When the body sizes of Maltese goats are considered (Table 1), it might be stated that they resemble Damascus and Kilis goats, while they have a larger body structure than our other native breeds (Soysal et al., 2003; Keskin and Gül, 2006; Şimşek and Bayraktar 2006; Vatansever and Akçapınar, 2006; Anonymous, 2008a,b). The live weights of Maltese goats resemble the live weights of Kilis, Damascus, Hair, Norduz and Honamlı goats, whereas they are higher than that of the Angora goat (Soysal et al., 2003; Keskin and Gül, 2006; Özder, 2006; Şimşek and Bayraktar 2006; Vatansever and Akçapınar, 2006; Anonymous, 2008a,b).

Table 1. Mean, standard deviation (SD), the lowest (min) and the highest (max) values of some body sizes in Maltese goats (Tölu, 2009a)

Tablo 1. Malta keçilerinde bazı vücut ölçülerine ait ortalama (\bar{x}), standart sapma (SS), en düşük ve en yüksek değerleri (Tölu, 2009a)

Traits (cm)	Birth (0-3 days)			
	Mean	SD	Minimum	Maximum
Body length	29.4	2.1	24.0	34.0
Height of withers	31.8	1.9	27.0	36.0
Heart girth	32.5	2.8	22.0	39.0
Heart depth	12.4	0.8	11.0	14.0
Rump height	31.3	1.9	26.0	35.0
Rump depth	10.6	0.8	9.0	13.0
Rump width	3.6	0.4	2.9	4.8
	Weaning (60 days)			
Body length	47.6	3.6	39.0	56.0
Height of withers	47.3	3.1	41.0	54.0
Heart girth	51.6	4.3	40.0	62.0
Heart depth	20.2	1.9	18.0	28.0
Rump height	46.9	3.2	40.0	54.0
Rump depth	18.6	2.0	16.0	26.0
Rump width	6.0	0.7	4.5	7.9
Ear length	14.4	1.4	11.0	18.0
Ear width	5.9	0.6	5.0	8.0
	Female yearling (14 months)			
Body length	66.4	4.8	59.0	79.0
Height of withers	63.5	3.5	58.0	70.0
Heart girth	68.1	4.2	60.0	76.0
Heart depth	27	2.7	21.0	31.0
Rump height	61.7	3.4	57.0	68.0
Rump depth	25.5	2.1	23.0	30.0
Rump width	9.1	0.7	8.1	10.2
Ear length	19.0	2.9	16.0	29.5
Ear width	7.3	0.6	6.2	8.8
	Goat (2-6 years)			
Body length	77.1	4.5	61.0	85.0
Height of withers	71.1	3.5	64.0	77.0
Heart girth	83.1	3.6	79.0	92.0
Heart depth	34.2	1.7	30.0	39.0
Rump height	69.0	2.8	62.0	74.0
Rump depth	30.8	2.2	27.0	35.0
Rump width	11.0	0.9	8.9	12.8
Ear length	20.0	2.0	17.5	25.0
Ear width	8.0	0.7	7.0	9.5

Table 2. Mean and standard deviation (SD) values of live weights according to ages in Maltese goats (Tölu, 2009a)

Tablo 2. Malta keçilerinde yaşlara göre canlı ağırlıklara ait ortalama (\bar{x}) ve standart sapma (SS) değerleri (Tölu, 2009a)

Age (year)	Mean	SD
1	29.83	5.30
2	42.28	4.44
3	43.84	5.54
4	46.30	5.47
5	52.87	6.70
6	54.29	2.49

Reproduction and Growth Traits

In the Maltese genotype reared within the framework of a TÜBİTAK (the Scientific and Technological Research Council of Turkey) project (106 O 411) in the Goat Husbandry Unit at Çanakkale Onsekiz Mart University, the number of kids per kidding goat was 1.9 in the first year and 2.4 in the second year (Tölu, 2009a). In the previous studies in Turkey, it was determined that the kid yield in Maltese goats was 1.847 per goat (Sönmez et al., 1971) and 1.8 on the Malta Island (Blundell, 1995). It is known that the number of kids per goat is 0.79-1.18 in Hair goats (Sönmez, 1974; Özder, 2006; Şengonca et al., 2003; Şimşek et al., 2006), 1.3 in Saanen x Hair goat crossbreeds (Şengonca et al., 2003), 1.6-1.8 in Gökçeada goats (Tölu and Savaş, 2010), 1.2-1.5 in Kilis goats (Güney et al., 1995; Soysal et al., 2003), and 1.6-1.9 in Damascus goats (Keskin and Gül, 2006). It is seen that the kid yields of the Maltese goat are also higher than those of Saanen (1.7), Alpine (1.7), Nubian (2.0) and Toggenburg (1.6) goat breeds (Amoah et al., 1996).

It was determined that the Maltese kids with a birth weight ranging from 2.9 to 3.0 kg reached 9.6-11.8 kg at weaning (40-60 days) with a daily live weight increase by 129-162 g (Tölu, 2009a). The birth weights range from 2.95 to 3.70 kg in Saanen x Hair crossbreeds and from 2.63 to 2.77 kg in the kids of pure Hair goat (Şengonca et al., 2003; Şimşek and Bayraktar, 2006). They were reported as 3.1 kg for Norduz kids (Kırk et al., 2004), between 2.76 kg and 2.84 kg for the kids of the Angora goat (Vatansever and Akçapınar, 2006), and between 2.74 and 3.57 kg for the kids of Bornova genotype (Duman and Demirören, 2002). The weaning weights were reported as 11.8 kg (Şimşek and Bayraktar, 2006) and 12.1 kg (Şengonca et al., 2003), for Hair goats at 60 days of age and as 9-10 kg for Damascus goats at 60-90 days of age (Keskin and Gül, 2006), and 16 kg of live weight was reported for Honamlı goats at 90 days of weaning age (Anonymous, 2008a). Nevertheless, it is expressed that the Alpine kids, reach 15 kg at 60 days of age (Morand-Fehr et al., 2002). As it will be seen, the Maltese genotype resembles the above-mentioned genotypes in terms of weaning weights; however, it reaches these weights earlier. Sönmez et al. (1971) report that the live weight increase ranges from 123 g to 209 g in Maltese kids until 12 weeks of age.

It was determined that the Maltese yearlings which particularly displayed fast growth until weaning reached 43% of the breeding season live weights of adult goats in the breeding

season (at 6-8 months of age) (Tölu, 2009a). The same value is 55.6% for Turkish Saanen goats (Tölu et al., 2009). They state that in dairy goat husbandry, the females might be used in breeding at 7-8 months of age when they reach 55% of the adult live weights (Morand-Fehr et al., 2002).

Milk Yield Traits

It was determined that the mean milk yields of Maltese goats were 330.4 kg and 275.4 kg in lactation lengths of 238-264 days, respectively (Tölu, 2009a). It was reported that the mean lactation length was 150-162 days in Hair goats (Sönmez, 1974; Şengonca et al., 2003; Şimşek et al., 2006), 232.75 days in Bornova goat (Şengonca et al., 2002), 201.49 days in Saanen x Hair goat crossbreeds (Şengonca et al., 2003), and 244.5 days and 257.6 days in Damascus goats and German Fawn Goat x Hair goat G₁ crossbreeds, respectively (Güler et al., 2007).

In Hair goats, the lactation milk yield ranges from 70 to 160 kg (Sönmez, 1974; Bhattacharya, 1980; Şengonca et al., 2003; Şimşek et al., 2006). The lactation milk yield was reported as 75 kg in Angora goats (Yertürk and Odabaşoğlu, 2007), 200-300 kg in Kilis goats (Güney et al., 1995; Soysal et al., 2003), 330-350 kg in Damascus goats (Keskin et al., 2004; Güler et al., 2007), 135-216 kg in Honamlı goats (Anonymous, 2008a) and 66-222 kg in Norduz goats (Anonymous, 2008b). On the other hand, the lactation milk yield is reported as 226-350 kg for Maltese goats (Sönmez et al., 1971; Blundell, 1995; Carnicella et al., 2008). It might be stated that the milk yields of Maltese goats are close to those of Damascus and some foreign breed crossbreeds.

In Maltese goats, the mean milk fat, milk protein and milk dry matter were determined as 4.92-5.46%, 3.42-3.41% and 14.2-14.7%, respectively (Tölu, 2009a). Depending on İzmen (1940), Bhattacharya (1980) provides the rates of milk fat and milk protein for Hair goats as 5.5% and 4.8%, respectively, and Soysal et al. (2003) provide the rate of milk fat as 5-5.5% again in Hair goats and 4.7% in Kilis goats. The milk fat and the milk protein are reported as 4.3% and 3.5% in Damascus goats, respectively, whereas the milk fat and the milk protein are reported as 4.1% and 3.4% in German Fawn Goat x Hair goat G₁ crossbreeds, respectively (Keskin et al., 2004). On the other hand, Güler et al. (2007) determined that the milk fat was 4.02% in Damascus goats and 4.55% in German Fawn Goat x Hair Goat G₁ crossbreeds. The milk fat and the milk protein were determined as 3.5% and 3.4% in Maltese goats in Italy, respectively (Carnicella et al., 2008), whereas the milk fat and the milk protein were determined as 3.8% and 3.3% in Maltese goats on the Malta Island, respectively (Blundell, 1995). As it is seen, the Maltese genotype has particularly higher values of milk fat (4.92%, 5.46%) than, and values of milk protein (3.42%, 3.41%) similar to, those of the native goat genotypes reared in our country.

Animal Health

In a comparative study on the kids of Gökçeada, Maltese and Turkish Saanen goat genotypes in terms of cases of diarrhea, the cases of diarrhea were observed significantly less in the Maltese genotype as compared to the other genotypes (Tölu, 2009b). Also in the case of

Ecthyma (*Ecthyma contagiosum*) experienced in the same genotypes, the disease progressed in a significantly milder way in the Maltese kids than in the other genotypes (Tölü et al., 2011). In another study on Gökçeada, Maltese and Turkish Saanen genotypes, it was determined that the health application per animal was made at a lower level in the Maltese genotype than in the other genotypes (Tölü and Savaş, 2011). In the light of the evaluations on health, the Maltese genotype has significant potential particularly when the inadequate environmental conditions experienced in the goat husbandry in our country are taken into consideration.

Conclusions

The fact that it was difficult to find the pure Maltese goat, which was sought under field conditions in order to purchase within the scope of the TÜBİTAK project, reinforces the phenomenon which was put forward by Ertuğrul et al. (2005) and which expresses that the genotype is seriously threatened by cross-breeding. However, this genotype is promising with its quite high kid yield, the growing abilities of kids and its superiority in terms of health traits. Besides its milk yield that might be considered adequate, its rates of milk protein and milk fat are also at quite good levels. Maltese goat breed is a good alternative for semi-extensive production conditions, especially in Turkey. Projects and studies on the pure production of the Maltese goat and its protection within the scope of gene sources should be carried on with precedence.

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