

Incidence of hoof deformities in honamli herd raised semi-intensively

Harun Çınar¹, Muhammed Yusuf Şirin¹

¹Department of Surgery, Faculty of Veterinary Medicine, Mehmet Akif Ersoy University, Burdur, Türkiye

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Correspondence:

H. ÇINAR
(hcinar@mehmetakif.edu.tr)

ORCID

H. ÇINAR : 0000-0003-4412-8949
M.Y. ŞİRİN : 0000-0002-7419-5774

ABSTRACT

Although hoof deformities are frequently encountered in small cattle, this situation is ignored by breeder until the animal shows signs of lameness. Nail deformities, environment, nutrition and individual characteristics of the animal are effective in the occurrence of foot diseases. Overgrowth is the most common cause of lameness. Correctly trimming the nails at regular intervals can prevent lameness. Lack of sufficient movement space in hovels and shelters, dung and urine on the floor of the hovel, inadequate walking and not going out to pasture prevent the nail from being sufficiently worn out and cause the nail to grow excessively and become deformed. Some congenital hoof defects, leg and foot posture disorders and similar structures pave the way for foot diseases in small ruminants. It is very important for the herd that animals with this structure are not used as breeding stock. In intensive breeding, foot diseases and hoof deformations cause significant economic losses. The aim of this study was to investigate the incidence of hoof deformities in semi-intensive Honamli goat herds. In the study, 163 Honamli breed goats were examined for hoof deformities. Hoof deformities were detected in 61 of 163 honamli goats. In the distribution of hoof deformities in Honamli goats; 54 (55,10%) of the goats with hoof deformities had lateral deviation hoof, 2 (2,04%) had corkscrew hoof, 2 (2,04%) had cleft hoof and 2 (2,04%) had beak-like hoof. It was concluded that Honamli goats are more resistant to hoof deformities than other small ruminant species and other goat breeds.

INTRODUCTION

The foot consists of a skin covered with a horn-like layer, soft tissues, and nail parts. The horn-like capsule of the livestock house is formed by the differentiation of cells in the outer layer of living tissue in the hoof. It acts as a weight-bearing shoe and protects the living parts of the hoof (HAYGEM, 2021).

Nail growth is a physiological process. As a result of excessive keratinization in the horn layer that forms the hoof, a regular increase in the hoof walls and sole occurs. Thus, the hoof grows regularly from the front wall, sole and heel (HAYGEM, 2021; Baran, 1997).

Abnormal hoof formations, including corkscrew deformities and inadequate heels are frequently seen in small ruminants. Overgrown and deformed toenails are common in the ones with untreated foot problems or inadequate nail trimming. Excess selenium in the diet can also cause abnormalities in the growth, moisture content, and condition of the nail wall, causing nails to crack and peel (Kaneps, 1996).

Goats are farm animals that produce meat, milk, hair and mohair by consuming cheap roughage, thus contributing economically to both the breeder and the country's economy (Bingöl and Mevliyaogulları, 2020).

Honamli goat, commonly bred in the panoramic landscape

of the Taurus Mountains encompassing the provinces of Antalya, Burdur, Isparta, and Konya, is more suitable for nomadic breeding systems. Due to significant genetic resources within herds and the nomadic lifestyle of breeders, there hasn't been sufficient scientific research conducted on Honamli goats (Topbaş and Dağ, 2019; Elmaz et al., 2012). Its body is generally black with white or brown spots on the forehead and legs. While males typically have curved horns, females are generally hornless. They have small, thick ears and a large, slender body. The distance between the two horns is 2 cm, indicating a degree of purity. The most characteristic feature is its curved nose. The calving rate is 98.8%. The birth weight of kids ranges between 3.86-4.7 kg. Adult females weigh between 70-75 kg, while males range from 80-85 kg. Lactation milk yield ranges from 135-216 kg (Daskiran et al., 2013)

The type of enterprise in goat breeding is determined by climate, soil and pasture conditions, plant and other animal production types and forms, and social and economic factors. In some countries and regions, there are large herds of thousands of animals in large pastures. In line with the recently changing demands in Turkey, semi-intensive or intensive goat breeding systems have begun to be seen, especially in Western Anatolia, the Aegean and Marmara Regions. The increase in demand for goat milk and cheese, especially in big cities, and the high prices of these products have made more professional goat breeding necessary (Daskiran et al., 2013).

In intensive goat breeding, goats obtained from natural conditions may develop various diseases depending on the growing conditions. Especially shelter and ground structure are the most important factors affecting goat foot health (Bingöl and Mevliyaogulları, 2020). Goats that do not go to pasture for a long time may grow taller. This situation makes the movement of the animal difficult and can cause various posture disorders. Especially the growth of hind hoof nails in goats may cause difficulties in vaccination. Therefore, extended hooves should be trimmed without delay. Nail trimming can be easily done with a sharp knife, nail knife or scissors. During nail cutting, care should be taken not to damage the living nail tissue and to shape the nails to ensure comfortable walking. In unintentional injuries, the injured area should be disinfected with disinfectants or juniper tar should be applied to the bleeding area (HAYGEM, 2021; Daskiran et al., 2013). Factors that predispose to foot diseases are wetness of hovel and courtyard floors, genetic defects, pasture conditions, seasonal changes, insufficient or excessive walking, mineral deficiencies and poorly groomed or incorrect nail cutting. Goats' hoof structures adapt to the characteristics of the pasture they graze on. The possibility of foot disease occurring increases during pasture, shelter environment and nutritional changes. Long rainy and humid seasons soften the nails, and cracks and breaks in the nails increase in extremely dry and hot seasons (HAYGEM, 2021).

All goats that do not go to pasture should have nail care done twice a year, and after the care, the animals should receive a foot bath with 8% zinc oxide (92 liters of water, 8 kg of zinc oxide) (HAYGEM, 2021).

This study aimed to investigate the incidence of hoof abnormalities in the semi-intensively raised Honamli goats.

MATERIALS and METHODS

The study instrument consisted of 163 Honamli goats raised semi-intensively. All goats in the herd were 1-5 years old. Goats are raised in the interior of the Mediterranean region of Turkey (37 68' N, 30 31' E) where continental climate weather conditions prevail. Goats were housed in semi-open barns and semi-intensive conditions. Housing conditions for animals consist of a traditional earthen floor. Goats were grazed on natural pasture between 8.00-16.00 hours. Goats were fed twice a day between 7-8 am and 15-16 pm with a diet containing 45% hay and 55% concentrate. Apart from this, fresh water was always available in their environment. It was determined that the goats in the farm did not perform any foot bath or routine foot care.

All goats were held in ventrodorsal position and hoof examinations were performed. Those who had nail deformities during the nail examination were recorded in the nail examination form (Figure 1). Excess horns on the hooves and soles and in the interdigital space were removed with a knife.

NAIL EXAMINATION FORM	
Date: .../.../....	
Patient	Patient Owner
Registration Number:	Name-Surname:
Type/Race:	Phone Number:
Name:	Adres:
Age:m/y	
Gender: Male <input type="checkbox"/> Female <input type="checkbox"/>	
Body Condition Score:	
<input type="radio"/> 1	
<input type="radio"/> 2	
<input type="radio"/> 3	
<input type="radio"/> 4	
<input type="radio"/> 5	
Walking Examination:	
<input type="radio"/> Normal	
<input type="radio"/> Hafif Topallık	
<input type="radio"/> Topallık Şiddetli	
<input type="radio"/> Topallık	
Hoof Deformities:	
<input type="radio"/> Gaga Tırnak	
<input type="radio"/> Aynk Tırnak	
<input type="radio"/> Tırbüyon Tırnak	
<input type="radio"/> Laterale Kıvrılma	
<input type="radio"/> Makas Tırnak	
Descriptions:	

Figure 1. Nail Examination Form

RESULTS

Of all 163 Anatolian goats, hoof disorders were diagnosed in 61. As a result of further examination of the hooves, it was determined that 54 (88.52%) had lateral deviation, 2 (3.27%) had corkscrew hooves, 2 (3.27%) had split hooves, and 2 (3.27%) had beak-like hooves. While hoof deformities were observed in most of the animals, especially in 37.42% of them, a range of specific deformities was also seen within the herd. These included lateral deviation affecting 33.12% of the herd, corkscrew claw affecting 1.22% of the animals, split claw affecting 1.22%, and an additional 1.22% affected by beak-like claws (Table 1).

Table 1. Results

Lesion	Number of Goats	Percentage Among Abnormals	Percentage of All Goats
Lateral Curling	54	88.52%	33.12%
Corkscrew Hoof	2	3.27%	1.22%
Split Hoof	2	3.27%	1.22%
Beak Hoof	2	3.27%	1.22%

DISCUSSION

This study aimed to investigate the incidence of hoof abnormalities in the semi-intensively raised Honamli goats. In a study conducted by Yurdakul (2018), it was determined that a significant rate of hoof deformity was present in 62.54% of lame sheep in the spring period before pasture. Similarly, it was observed that the rate of hoof deformities was 87.75% in the autumn period after pasture. According to Yurdakul (2018), the rate of hoof deformities was found to be 67.74% in both periods (Yurdakul, 2018). In the our study, it was found out that the incidence of hoof deformation in Honamli goats was 37.42% (61/163). It was also determined that although the herd used in the study had not previously been conventionally trimmed, the hoof deformities observed were within typical limits.

According to the study conducted by Aguiar et al. (2011), the prevalence of foot diseases was found to be 19.41% (170/876) in sheep and 17.99% (52/289) in goats. The study found that prevalence ranged from 5.77% to 33.85% across various farms. In our study, the rate of hoof deformities in goats was 37.42% (61/163) (Aguiar et al., 2011). In the study, it was found out that the incidence of hoof deformation in Honamli goats was 37.42% (61/163). It was also determined that although the herd used in the study had not previously been conventionally trimmed, the hoof deformities observed were within typical limits.

In the study of Ajuda et al. (2019), on the relationship between hoof deformation and the incidence of hoof length and lameness in goats, the findings revealed a remarkable prevalence of hoof deformity of 58% (Ajuda et al., 2019). In the our study, it was found out that the incidence of hoof deformation in Honamli goats was 37.42% (61/163). It was also determined that although the herd used in the study had not previously been conventionally trimmed, the hoof deformities observed were within typical limits.

Hill et al. (1997) analyzed random samples of 307 adult goats from four large commercial dairy farms. The study found that 91% (2.6% to 24.4%) of these goats had foot disease (Hill et al., 1997). In the study, it was found out that the incidence of hoof deformation in Honamli goats was 37.42% (61/163). It was also determined that although the herd used in the study had not previously been conventionally trimmed, the hoof deformities observed were within typical limits.

In the study of Prado et al. (2022) 12 non-lactating female Saanen goats were used. Hoof deformity was encountered in 81 of 96 hooves of the goats used in the study and the rate of hoof deformity was found to be 84.37%. After trimming the

hoof with nail clippers, the hoof was trimmed again on a certain date. In this case, the rate of hoof deformity decreased to 42.71% (41/96) (Prado et al., 2022). In this study, it was found out that the incidence of hoof deformation in Honamli goats was 37.42% (61/163). According to the results, it is seen that the incidence of hoof deformity is lower in Honamli goats compared to Saanen goats if the hoof cutting shapes are under the same conditions.

Tutuş and Gençlepe (2021) conducted a study on the incidence of foot diseases in 2000 heads of cattle, 4500 heads of sheep and 500 heads of goats. As a result of this study, the incidence rate of foot diseases and hoof deformities was 8.10% in cattle, 9.71% in sheep and 6% in goats, respectively. In the distribution of foot diseases and hoof deformities in cattle; laminitis 3.70% (6 cases), sole ulcer 5.55% (9 cases), heel rot 8.64% (14 cases), interdigital dermatitis 6.17% (10 cases), digital dermatitis 4.93% (8 cases), white line disease 6.79% (11 cases), nail crack 2.46% (4 cases), pointed nail 25.30% (41 cases), blunt nail 13.58% (22 cases), broad-wide and full nail 8.02% (13 cases), open nail 6.17% (10 cases), corkscrew nail 4.32% (7 cases), scissor-like nail 2.42% (4 cases), beak nail 1.85% (3 cases) and 162 cases in total (Tutuş et al., 2021). In the our study, it was found out that the incidence of hoof deformation in Honamli goats was 37.42% (61/163). In the distribution of hoof deformities in Honamli goats; 54 (88.10%) of the goats with hoof deformities had lateral deviation hoof, 2 (3.27%) had corkscrew hoof, 2 (3.27%) had cleft hoof and 2 (3.27%) had beak-like hoof.

CONCLUSIONS

As a result, the incidence rate of hoof deformities in Honamli goats raised semi-intensively was determined as 37.42%. It was concluded that Honamli goats are more resistant to hoof deformities than other small ruminant species and other goat breeds. In addition, it was aimed to raise awareness of animal breeders about hoof and foot diseases and improvement of

shelters for better animal breeding.

DECLARATIONS

Ethics Approval

This study does not present any ethical concerns.

Conflict of Interest

The authors declared that there is no conflict of interest.

Consent for Publication

No applicable.

Author contribution

Idea, concept and design: HÇ, MYŞ

Data collection and analysis: HÇ, MYŞ

Drafting of the manuscript: HÇ, MYŞ

Critical review: HÇ, MYŞ

Data Availability

The author has provided the required data availability statement, and if applicable, included functional and accurate linksto said data therein.

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