RESEARCH PAPER

The effect of body and udder measurements on milk lactose in native goat

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Abstract

This research was conducted in order to learn the effects of body and udder measurements on milk lactose levels. As a result of analysis of correlation is seen a negative effect of the udder circumference on the lactose content of the milk (r=-0.386; p=0.039).Withers height, which is one of the body measurements, was also positively affected on milk lactose (r=0.426; p=0.021). According to the result of the research, high udder circumference and low withers height is seen as an advantage in order to obtain low lactose-containing milk against lactose into lerance.

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Introduction

Lactose, the predominant carbohydrate in milk, is adisac charide consisting of galactose bound to glucose. Intestinal absorption of lactosere quireshy drolysisto its component monosac charides by the brush-borderen zymela ctase. In most of the world, the adult population under goes a genetically programmed decrease in lactasesyn thesis after weaning, resulting in lactosemal absorption. If a sufficient amount of lactose is ingested, gas tro intestinal symptoms may result, including diarrhea, bloating, flatulence, and abdominal discomfort (Cakir Sahilli and Cimen, 2016).

Lactosemal absorption is an extremely common condition worldwide, and its incidence increases with age and varies between ethnicities (Law *et al.*, 2010; Keith *et al.*, 2011). Bacteria in the colon fermentundig estedlactos eintoshort-chainfattyacids, hydrogen, methane, and carbondioxide, resulting in such symptoms as bloating, abdominal pain, and or diarrhea after ingestion of lactose (Law *et al.*, 2010). National Institutes of Health (NIH) consensus development panel defined lactose into lerance as aclinical syndrome characterized by the on set of gas trointestinal symptoms following lactose challenge, (Suchy *et al.*, 2010) where as true lactosemal absorption is identified through a hydrogen breath test (HBT). Many people with lactosemal absorption do no treportcl in icallactose intol erance (Savaiano *et al.*,2006; Vesa *et al.*, 1996). Conversely, many individuals with perceived lactose into lerance do not experience mal absorption (Jellema *et al.*, 2010). Because of in consistent definitions in previous studies, the true prevalence of lactose in tolerance is unknown (Shaukat *et. al.,* 2010).

It is widely accepted all around the world that livestock industry has a strategical significance. Bio-chemical parameters in the milk become more of an issue for both human health and the production of dairy products (Hossainand Dev, 2013; Zenebe *et al.*, 2014). Therefore, exploring milk bio-chemical parameters accepted as the criteria for identifying the value of milk and thes ituations having effect on these parameters willlight the way for producers about milk yield (Tekelioglu *et al.*, 2010; Yildirim *et al.*, 2009).

The elements such as breed, age, weight and stress factor, which affect milk yield in animals, have influence upon milk bio-chemical parameters (Cimen *et al.*, 2008). Milk lactose level is affected by the type of birth of theanimal (single, twin) (Cakir Sahilli and Cimen, 2016).

Lactose is an important parameter in human nutrition. It also plays a role in obtaining dairy products. Investigation of effective factors on lactose levels is important in terms of eliminating the deficiencies in the literature. However, upto now no information has been found in the literature showing there lationship between lactose levels and body and udder characteristics in native goats. Where as in the Mediterranean countries milk obtained from the goats is predominantly derived from native goats. This research on native goats will close an important gap in the literature. Correlation alanalysis results in the study will also play a role in breeding trials to improve milk parameters. The first study to show the correlation coefficients between of body and udder morphology and lactose in native goats makes work valuable. There lationships between body and udder measurements and milk lactose levels are important for the dairy sector. In this study, it was tried to determine the effects of body and udder measurements on milk lactose levels in native goats.

Materıal and methods

Data and sampling tecniques

In order to determine the effects of body and udder measurements on lactose levels, milk samples were collected once in the 3rd and 4th weeks in the first month of lactation from a total of 30 native (Kıl) goats. Lactose data were recorded by taking the average of two weeks. The measurement procedure of udder and body was based on the methodology used by Atay and Gökdal (2016).

Milk samples and analysis

Equal amounts of milk were collected from each teat. Milking was carried out using sterilized sample containers. After collecting a sufficient amount of milk for analysis (100 ml),

the samples were taken to the laboratory in a short time. The milk samples collected from the animals were analyzed using a Funke Gerber Lacto star 3510 analysis device.

Statistical analysis

In order to determine the effects of body and udder measurements on milk lactose levels,

correlation and regression analyses were conducted (Çimen, 2015). SPSS package software was used to carry out these analyses.

Results and discussion

Table 1 shows the results of the correlation analysis conducted to learn about the effects of body measurements on milk lactose levels.

Table 1. The effect of body measurements on milk lactose.

		Body length	Withers height	Rump height
Lactose, %	Correlation coefficient, (r)	0.335	0.426	0.238
	Significance level, (p)	0.076	0.021	0.214

As seen in Table 1, no relationship was found between the lactose levels in the milk of native goats and body length orrump height. However, a positive medium-level relationship was found between lactose levels and withers height in native goats (r=0.426, p=0.021). Starting with the positive result found in the correlation analysis, regression analysis was conducted to determine the extent to which milk lactose levels increase based on with earthlight. As a result of the regression analysis, it was found that a 1-cm increase in with earthlight had a tendency to

increase lactose levels by 0.02% units (p<0.05). It was found noteworthy that, among body measurements, with earthlight had a positive and medium-level effect on milk lactose levels. The fact that this study was conducted using other goat races that are not milk goats has significance in support of the results of research. Banda *et al.*'s (1992) statement that lactose levels vary based on the breed of goats gives rise to the idea that this study should be replicated with different goat breeds to support the results of this research.

Table 2. The effect of udder measurements on milk lactose.

		Udder circumference	Udder depth	Teat length	Teat diameter
Lactose, %	Correlation coefficient, (r)	-0.386	0.204	- 0.020	0.121
	Significance level, (p)	0.039	0.288	0.916	0.531

According to Table 2, there were no relationships found between the lactose levels in the milk of native goats and the variables of udder depth, teat length or teat diameter. Additionally, a negative and weak relationship was found between udder circumference in native goats and lactose levels in the milk (r= -0.386, p=0.039). Based this result found in the correlation analysis, regression analysis was conducted to determine the extent to which milk lactose levels change based on udder circumference. As a result of the regression analysis, it was found that a 1-cm increase in udder circumference had a tendency to decrease lactose levels by 0.01% units (p<0.05).

It is an important finding that, among udder measurements, udder circumference had a negative and weak effect on milk lactose levels. It is necessary that the results in this study about the effect of udder circumference on lactose levels is supported by similar future studies. As opposed to the results of our study, the study by Sarı *et al.* (2015) on sheep did not find a relationship between milk lactose levels and udder measurements such as udder circumference, udder depth, teat length, and teat diameter. As their study was conducted with sheep, the differences between the results of their study and those of our study may have been effected by the species of animal used.

According to the results of the study, in order to obtain milk with low lactose levels, high udder circumference and low withers height may be seen advantageous.

According to these results, milk producers and dairy cattle breeders should be able to choose breed animals according to breed and body characteristics for low lactose milk production, choosing according to high udder circumference and low withers height. This study is particularly important in that the body and udder measurements in native goats are related to milk parameters such as lactose. In the Mediterranean countries where native goats are raised for the purpose of milk production, selection of native breeder breeds for breeding and body characteristics is important in manipulation to milk parameters.

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