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The effect of birth type and sex of kids on milk lactose levels

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Abstract

This research was conducted in order to learn the effects of birth type (single or twins) in goats and sex of kids upon milk lactose levels. Therefore, 14 native goats (kıl) based on birth type and another 14 native goats (kıl) based on sex of kids were divided into two groups. Milk sample for once was obtained from the kids in the 3rd and 4th weeks of lactation. Lactose levels were specified as the mean of two weeks. As a result of series of analysis, no statistical differences were found in terms of milk lactose levels in the goats giving birth to female and male kids. However, it was found that birth type had a significant effect on milk lactose level. Also, it was found that milk lactose levels of the goats giving birth to twins were lower than milk lactose levels of the dams giving birth to one offspring. According to the results of the research, it can be said that it will be relatively advantageous for the ones showing mild lactose intolerance to prefer milk of the goats giving birth to twins.

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Introduction

Lactose, the predominant carbohydrate in milk, is a disaccharide consisting of galactose bound to glucose. Intestinal absorption of lactose requires hydrolysis to its component monosaccharides by the brush-border enzyme lactase. In most of the world, the adult population undergoes a genetically programmed decrease in lactase synthesis after weaning, resulting in lactose malabsorption. If a sufficient amount of lactose is ingested, gastrointestinal symptoms may result, including diarrhea, bloating, flatulence, and abdominal discomfort.

Lactose malabsorption 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 ferment undigested lactose into short-chain fatty acids, hydrogen, methane, and carbon dioxide, 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 intolerance as a clinical syndrome characterized by the onset of gastrointestinal symptoms following lactose challenge, (Suchy *et al.,* 2010) whereas true lactose malabsorption is identified through a hydrogen breath test (HBT).

Many people with lactose malabsorption do not report clinical lactose intolerance (Savaiano *et al.,* 2006; Vesa *et al.,* 1996). Conversely, many individuals with perceived lactose intolerance do not experience malabsorption (Jellema *et al.,* 2010). Because of inconsistent definitions in previous studies, the true prevalence of lactose intolerance is unknown (Shaukat *et. al.,* 2010).

It is widely accepted all around the world that livestock industry has a strategical significance. Biochemical parameters in the milk become more of an issue for both human health and the production of dairy products (Hossain and Dev, 2013). Therefore, exploring milk biochemical parameters accepted as the criteria for identifying the value of milk and the situations having effect upon these parameters will light 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 biochemical parameters (Cimen *et al.,* 2008).

Many studies have been done the effect of birth type and sex of offspring on milk lactose levels of small ruminants such as sheep (Yilmaz *et al.,* 2011; Sezenler *et al.,* 2016). However, there have been no detailed studies to find out the effect of birth type and sex of kids on milk lactose levels in goats.

Therefore, in this study, effect of birth type and sex of kid in native goats on milk lactose levels was specified.

Material and method

Animals and feeds

With an aim of specifying the difference between milk lactose levels with respect to birth type and sex of kid in goats, 14 native goats (kıl) based on birth type and 14 native goats (kıl) based on the sex of kid were divided into 2 groups. All goats fed rations *containing 90% forage* and *10% concentrate*.

Analyses of the milk samples

Milk sample for once was taken from the goats in the first month and the 3rd and 4th months of lactation. Lactose data as the mean of two weeks were obtained. Equal amount of milk was taken from the teat of the goats. Milking was performed to sterilized and numbered sample vessels. After sufficient milk (100ml) was taken for the analysis, it was transferred to the laboratory in a short time.

The analysis of milk samples taken from the animals was carried out by means of Funke Gerber Lactostar, 3510 analysis device.

Statistical analysis

With an aim of learning the effect of birth type and sex of kid on milk lactose levels, independent two sampled t-test analysis method was used (Cimen, 2015; Cimen, 2016). SPSS package program was benefited to make this analysis (Norusis, 1993).

Result and discussion

The effect of birth type

Results related to statistical analysis in the research made with an aim of learning the effect of birth type on milk lactose levels were given in Table 1.

Table 1. The effect of birth type on milk lactose.

Birth Type	Mean (%)	Standard Error	Significance level
Single	4.98	0.09	0.023
Twin	4.72	0.02	

As it is seen in Table 1, milks of the goats giving birth to twins and a single kid showed differences in terms of milk lactose levels. Lactose mean values in milks of the goats giving birth to one offspring was found statistically higher ($p<0.05$). Reporting that birth type didn't have an influence upon milk lactose levels in the research made for the sheep don't compatible with the result we found for native goats (Yilmaz *et al.,* 2011; Sezenler *et al.,* 2016).

As known, goats have a *higher milk yield than sheep and twin kids have lower milk intakes than single kids*. In the study, twin kids were more stressed because of lower milk intake when compared with single kids. The dams and their single kids showed fewer behavioral signs of stress than the dams giving birth to twin kids and their offspring. This stress might be due to the low milk intake in twin kids. High milk yield associated with stress in dams giving birth to twins and low milk intake per kids may negative effect on lactose synthesis in udder of dams have twin kids. Higher milk yield in goats than that of sheep may reason of different results in literature. According to Topçu (2012) higher milk yield has negative effect on milk lactose synthesis.

This expression can explain the cause of low milk lactose in dams giving birth to twin kids. According to the result found in our study, preferring the milks of the goats giving birth to twins can be relatively advantageous for the ones showing lactose intolerance. However, this advice is valid for the ones showing mild intolerance rather than the ones showing high lactose intolerance. Because lactose levels (4.72%) in the milks of the goats giving birth to twins constitute a risk for the ones having severe lactose intolerance.

The effect of kid sex

As shown the Table 2, lactose levels of the goats giving birth to female and male kids have statistical similarities. According to this result, it can be said that sex of kid doesn't have an influence on milk lactose levels. It was observed in the research that milks of native goats obtained from both different kid sexes and birth types were in the borderline specified for healthy goats (Kaneko *et al.,* 1997).

Table 2. The effect of kid sex on milk lactose.

Kid Sex	Mean (%)	Standard Error	Significance level
Male	4.79	0.02	0.428
Female	4.76	0.03	

According to the results, it was specified that birth type (twin or single) in native goats had an influence on milk lactose levels but sex of kid didn't have an influence on announced milk parameter. Confirming the result found in the research with other goat breeds will be beneficial. In case of similar results to be obtained from future researches, it should be researched that why birth type in goats has an influence on milk lactose levels different than the sheep. Because information related to low milk lactose levels of the goats giving birth to twins isn't available in the literature.

Therefore, this result found in the research fulfills a need. According to the result found in the research, preferring the milks of the goats giving birth to twins can be relatively advantageous for the ones showing lactose intolerance.

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