Short Communication

Machine Milked and Suckled Goats Differ in Some Biochemical Components of Their Milk in 1st and 2nd Weeks of Lactation

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ABSTRACT

This study was aimed at determination of biochemical components of machine milked and suckled goat milk associated with pecuniary profit in the 1st and 2nd weeks of early lactation period. For this purpose, 10 machine-milked and 10 suckled Turkish Saanen Goats were used. The milk fat rate was lower in machine milked goats than in suckled goats for both the periods. The protein levels were lower for 2nd week in machine milked goats compared with suckled goats. There was no difference ($p>0.05$) between the two groups of goats for total nitrogen. It was concluded that suckling improves fat in goat milk, which makes it more profitable. © 2010 Friends Science Publishers

Key Words: Milk; Economic; Component; Goat; Machine milking; Week environment

INTRODUCTION

The total amount of fat and protein coupled with the price tags on these two components form the basis for computing milk value and animal efficiency. These two parameters from animal products have got suitable economic profits (Zhigang, 2006). Milk protein and fat have economic value, because higher protein and fat leads to higher milk products such as cheese (Grant, 1993). They are therefore, called biochemical components associated with pecuniary benefit. The economic biochemical parameters of milk impact product development and international trade in milk components (Colemann, 2006). Recently, researches and dairy producers focus on maximizing biochemical parameters having economic importance such as milk fat and protein. This research was aimed to investigate the effect of environmental factors such as lactation weeks and machine milking on biochemical components associated with pecuniary gain of goat milk in first weeks of early lactation period.

MATERIALS AND METHODS

In the research, 10 machine-milked and 10 suckled Turkish Saanen Goats were used during first two weeks of early lactation. To determine milk composition, samples from both groups were obtained by hand milking. Goats were fed standard ration and roughage. Milk samples were composites of milk collected at consecutive morning and afternoon. The samples were collected into plastic vials

preserved with microtabs, stored 4ºC until analyzed for determination of parameters. The total protein and nitrogen of the milk was determined by Kjeldahl method (N×6.38). The milk fat was determined by Roese-Gottlieb method (Hundrieser *et al.,* 1984). All of the data are indicated as mean ± SEM. Comparisons were done by using t-test with help of the SPSS (Norusis, 1993).

RESULTS AND DISCUSSION

As shown in Table I and II, the milk fat rates in machine milked goats were lower than suckled group for both week ($p<0.05$). However, the protein levels were lower for only second week in machine milked goats ($p<0.05$). The milk nitrogen levels were similar for both the groups of goats ($p>0.05$).

Milk components of machine milked and suckled goats in this study are consistent with normal values for goats reported by Koneko and Cornelius (1980). The milk fat rates of machine milked were low for economic cheese yield, because milk must include a fat percentage at least 3.2% for affordable cheese production (Kurt *et al.,* 2003). We can explain the mechanism of low milk fat levels that the milking machine seizes cisternal milk but not alveolar milk, where most of the fat is found (Thomas *et al.,* 2001). Marnet and Negrao (2000) have expressed the first possibility; increased oxytocin level as a result of the suckling could stimulate milk secretion by the epithelial cells, for as long as these dams remain during suckling period with their kids. Therefore, only the cisternal milk

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Table I: Biochemical parameters having economic importance in milk for first week

Parameters	Goats		
	Machine milked	Suckled	P
Fat (%)	2.8±0.3	3.3±0.2	*
Protein (%)	2.9±0.3	3.0±0.5	N.S
Total nitrogen (%)	0.4±0.4	0.3±0.5	N.S

Table II: Biochemical parameters having economic importance in milk for second week

Parameters	Goats		
	Machine milked	Suckled	P
Fat (%)	2.6±0.4	3.2±0.2	*
Protein (%)	2.8±0.1	3.2±0.3	*
Total nitrogen (%)	0.4±0.6	0.4±0.3	N.S.

*P<0.05, N.S.: Not significant

Table III: Biochemical parameters having economic importance in milk for both weeks in machine milked goats

Parameters	Weeks		
	First	Second	P
Fat (%)	2.8±0.3	2.6±0.4	N.S.
Protein (%)	2.9±0.3	2.8±0.1	N.S.
Total nitrogen (%)	0.4±0.4	0.4±0.6	N.S.

Table IV: Biochemical parameters having economic importance in milk for both weeks in suckled group

Parameters	Weeks		
	First	Second	P
Fat (%)	3.3±0.2	3.2±0.2	N.S.
Protein (%)	3.0±0.5	3.0±0.5	N.S.
Total nitrogen (%)	0.3±0.5	0.4±0.3	N.S.

N.S.: Not significant

fraction is assumed to be available during machine milking, because removal of the alveolar milk fraction would require active myoepithelial contraction (Bruckmaier *et al.,* 1994). It has been estimated that up to 75% of the total fat production within the udder is concerned with the alveolar milk component (Labussiere, 1969). Although the physical causes are currently unknown, one could theorize that the stress concerned with isolation of machine milked goats from their kids might have played a role in hindering fat transfer. A more rapid evacuation of the udder of goats suckling their own kid, through increased oxytocin production, might reduce the involution of udder epithelial cells in early lactation.

As shown in Table III and IV, all biochemical parameters were similar between weeks in machine-milked and suckled groups (p>0.05).

Suitable feeding regimes to increase production of milk fat and protein are indispensable for achieving affordable benefits. The changes in milk components associated with pecuniary profit result in different economic values of milk and milk products. Acquiring knowledge associated with economic parameters to increase production of milk with maximum levels of milk fat is essential for achieving the economic benefits. Therefore, further researches are needed to improve the interpretations about milk components associated with pecuniary gain in machine milked goats considering the reasons for lower milk fat and to observe the effect of biochemical components having economic importance on productivity of milk and its products. The consumer's willingness to select nonfat milk components suggests the need for updating milk pricing systems to award dairymen according to the nonfat value of their milk. This can be accomplished by allowing protein to represent the value of the nonfat portion of milk. Linking dairy foods with life-giving milk protein creates a healthy public image for dairy foods. Consumers are aware of their need for protein to maintain good health. The total amount of fat and protein coupled with the price tags on these two components form the basis for computing milk value. Therefore, further researches are needed to achieve the observation about economic parameters in machine milked goats considering the reasons for lower milk fat and to determine the effect of economic parameters such as fat and protein on milk yields.

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