

Effect of Lactation on Physico-Chemical Properties of Local Goat Milk

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Abstract

The present investigation was undertaken in the Department of Animal Husbandry and Dairying, Dr.PDKV., Akola. The main objective of present investigation was to study the effect of lactation on composition and physico-chemical properties of local goat milk. During the entire study the fresh goat milk samples were collected from local goats in I, II, III and IV lactations of which four goats were in each lactation. The lactation had significant increasing effect on fat, protein, ash, TS, SNF, titratable acidity and viscosity. All milk components are gradually increased from I to IV lactation with exception of lactose and pH.

Keywords: Local goat, Milk, Lactation, Physico-chemical properties.

Introduction

India is one of the largest agricultural country in the world. Goat keeping in India constitute an important rural business of small marginal farmers and landless labours due to multifold advantages like short generation interval, high rate of prolificacy, easy in management and marketing over large ruminants in the world.

India ranks first for goat population in the world. The goat population in India was 124 million (Census, 2003) which is 1.38 % annual growth rate of goat.

The share of goat milk is 2550 thousand million tones annual total milk produced of our country. Goat milk like cow milk has high concentration of major nutrients in relation to caloric value and it resembles human milk in composition. Goat milk have higher medicinal value and it also contains 4.4 per cent fat, 0.137 per cent Ca, 0.112 per cent P, 0.017 per cent Mg, 0.170 per cent K and 3.4 per cent milk protein (Holmes *et al.*, 1946). It provided 72 Kcal per 100 g goat milk products. A brief knowledge of physico-chemical properties of goat milk will help in understanding the effect of various method of processing on the quality of goat milk and milk products. In present investigation an attempt was made to study composition of local goat milk and the effect of lactation on composition of local goat milk.

Materials and Methods

The present research work was undertaken at Department of Animal Husbandry and Dairying,

Dr.PDKV., Akola during the year of 2004-2005. The present study, 16 local goats were selected from Flock maintained at the University Livestock Instructional Farm. The selected 16 goats were from I, II, III and IV lactation. The local goats were kept under standard uniform conditions of feeding and management with semi stallfed. The local goat milk samples were collected early in the morning during these period individual local goats was milked completely. Local goat milk was analyzed for fat, protein, lactose, SNF, ash and Total Solids as per BIS standard specifications. Viscosity was determined by Hoppler-Viscometer at 30°C to the procedure mentioned by Tambat (1975). Milk samples were analyzed for physical and chemical properties. The observations were statistically analyzed using analysis of variance technique with precision to the number of lactation.

Results and Discussion

Effect of stage of lactation on chemical properties of local goat milk:

Fat: According to Table-1, Fat content was lowest in first lactation and significantly increased in II, III and IV lactations. Effect of lactation showed significant differences on fat content of milk.

The findings of present investigation are in agreement with Charnobai *et al.* (1999) reported that the lactation period influenced the fat content of goat milk.

Protein: It was observed that the protein content of goat milk significantly affected due to lactations and the average protein content gradually increased from

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I to IV lactation.

The findings of present investigation is in agreement with Haenlein (2002).

Lactose: The highest percentage of lactose was observed in first lactation whereas, decrease in second, third and fourth lactation.

The present findings are in agreement with Antunac *et al.* (2001) who studied the effect of number of lactation on changes in the chemical composition of goat milk. Higher content of lactose were determined at the beginning of lactation in comparison with middle of lactation.

Ash: It was observed that ash content of local goat milk significantly increased from I to IV lactations. Highest ash content was noted on fourth lactation and lowest on first lactation.

The findings are in agreement with Aganga (2002) who studied the milk composition of Tswana goat and Ewes milk and also studies the effect of lactation on composition of goat milk and reported that minerals fluctuated in both goats and ewe milk throughout the lactation period.

Solid-not-fat: The solids-not-fat content was significantly lowest in first lactation which gradually increased upto fourth lactation.

Findings of present investigation are in agreement with Antunae *et al.* (2001). They studied the number of lactation on changes in the chemical composition of goat milk.

Total Solids: The total solids content of milk was minimum in first lactation and maximum in fourth lactation. Total solids gradually increased from first to fourth lactation.

The above findings are in agreement with Chanobai *et al.* (1999) stated that total solids values decreased during the initial months and increased at the end of lactation.

Effect of stage of lactation on physical properties for local goat milk

Specific gravity: From Table 2, the average specific gravity of local goat milk was found to be increased in each lactation. The findings of present investigation are

in agreement with Arguello *et al.* (1998).

Titrateable acidity: The titrateable acidity of goat milk significantly increased from I to IV lactations. It was also noted that the lactations had significant effect on titrateable acidity content of local goat milk.

The results obtained in the present investigation are in agreement with the findings reported by Fandialan and Davide (2001), studied the relation between pH and titrateable acidity in goat's milk.

pH: The pH content of local goat milk decreased from I to IV lactation. It was observed that the pH content of local goat milk was significantly affected due to lactation.

The above findings are in agreement with Fandialan and Davide (2001) who studied the relation between pH and the titrateable acidity in goat's milk.

Viscosity: The viscosity was significantly increased from I to IV lactations. The highest viscosity was noted in fourth lactation and lowest in first lactation. It was observed that viscosity of goat milk significant by affected due to lactation.

The findings of present investigation viscosity of local goat milk are in agreement with findings of Davide *et al.* (2001).

In general, from this investigation the lactation had significant increasing effect on fat, protein, ash, total solids, SNF, titrateable acidity and viscosity except lactose, pH and specific gravity. All the milk components are gradually increased from I to IV lactation with exception of lactose and pH.

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Table- 1: Effect of lactation on chemical properties of local goat milk (Percent)

Lactation No.	Fat	Protein	Lactose	Ash	Solids-not-Fat	Total solids
First	3.546	3.217	4.887	0.680	8.757	12.332
Second	3.652	3.487	4.721	0.739	8.945	12.599
Third	4.088	3.801	4.509	0.799	9.047	13.198
Fourth	4.545	4.097	4.191	0.863	9.186	13.667
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
SE (m)±	0.031	0.045	0.023	0.004	0.049	0.074
CD (P=0.05)	0.099	0.142	0.072	0.013	0.158	0.237

Table-2: Effect of lactation on physical properties of local goat milk (percent)

Stage of lactation	Specific gravity	Titratable acidity	pH	Viscosity
First	1.025	0.122	6.493	1.660
Second	1.027	0.127	6.369	1.733
Third	1.028	0.134	6.298	1.763
Fourth	1.029	0.151	6.232	1.863
'F' test	NS	Sig.	Sig.	Sig.
SE (m)±	-	0.001	0.015	0.005
CD (P=0.05)	-	0.004	0.047	0.015

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