EPH - International Journal of Biological & Pharmaceutical Science
ISSN (Online): 2208-2166
Volume 03 Issue 01-January-2017

DOI: https://doi.org/10.53555/eijbps.v3i1.18

STUDIES ON PHYSICO-CHEMICAL PROPERTIES OF SANGAMNERI GOAT MILK IN VARIOUS SEASONS OF MILKING

Ashwini Mukhekar [1*], R. J. Desale[2], Madhav Potey [3]
Department of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri -413 722 Ahmednagar (MS) India
[*1]*Ph.D. (Agri.) Scholar, Department of Animal Husbandry & Dairy Science, MPKV, Rahuri*
[2] *Assistant Professor, Department of Animal Husbandry and Dairy Science, MPKV, Rahuri- 413 722*
[3] *M.sc. (Agri.) Scholar, Department of Animal Husbandry & Dairy Science, MPKV, Rahuri*

[*]***Corresponding author:-***
E-mail: ashmukhekar5@gmail.com

Abstract:-
The objective of the research work to study the physico-chemical properties of Sangamneri goat milk namely fat, protein, lactose, total ash, titratable acidity, pH and total solids. During the entire study the fresh goat milk samples of Sangamnari goats were analyzed for chemical properties such as fat, protein, lactose, total ash, titratable acidity, pH and total solids also the minor content viz. Fe, Cu, Mn, and Zn of Sangamneri goat milk in summer, rainy and winter seasons, respectively. The data were statistically analyzed by using completely Randomized Design (CRD) with three treatment and six replications. There was significant variation (P<0.05) was observed among the season of milking as regard iron, manganese, copper and zinc content of Sangamneri goat milk.
There was no significant (<0.005) among the seasons of milking in respect of protein, total ash, titratable acidity, pH and total solids. Whereas, significant variation P(<0.005) was observed among the season of milking as regard fat, lactose, iron, manganese, copper and zinc content of sangamneri goat milk. The overall mean values of chemical composition of milk were 5.24 per cent fat, 3.62 per cent protein, 4.06 per cent lactose, 0.76 per cent total ash, 0.128 per cent titratable acidity, 6.42 pH and 13.62 per cent total solids of Sangamneri goat milk. The mean values of fat, lactose content of Sangamneri goat milk significantly increased from summer to winter season.

Keywords:-*Goat milk, physico-chemical properties, minor minerals, seasons*

INTRODUCTION

In the developing countries, goats make a very valuable contribution, especially to the poor class in the rural areas. Goat keeping in India constitutes 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 ruminant in the India. India ranks second in the world goat population followed by china.

About 18 to 20 lakh families are involved in goat and sheep rearing with an average strength of 1 to 7 goats per household. Goat is also known as poor man's cow. It is one of the important and multipurpose species of livestock economically maintained for meat, milk, fiber, skin and manure production. Therefore, goats are proved to be a boon to the poor, landless labourers and marginal farmers.

Goat milk has higher medicinal value and it also contains 4.5 per cent fat, 3.3 per cent milk protein, carbohydrate 4.6 per cent, Ca 170 mg/100 gm and P 120 mg/100 (Haenlein, 2004). The fat globules of goat milk are smaller than those of cow milk and probably this is one of the reasons for the easy digestion of goat milk (Fevrier et al; 1993 and Haenlein, 1996). Fatty acids present in goat milk are of considerable interest in medicine because they are used for the treatment of various ailments e.g., malabsorption, syndromes, intestinal disorders, coronary diseases, premature infant nutrition.

A goat appears to be the best suited to overcome these problems by way of producing better nutrition in the form of goat milk. This gives much support to the contention that improved gat milk production is one of the best strategies to relieve human starvation, under nutrition and malnutrition and therefore, great market growth potential incentive and justification specially in areas where pasture conditions.

Milk is complex fluid containing proteins, fats, carbohydrates, vitamins, minerals (Fe, Mn, Cu, Zn) etc. The nature and composition of these constituents are influenced by various production and processing factors. Effects to improve goat milk production in the country will provide supplementary source of income to weaker section of society (Agnihotri and Prasad, 1992). Sangamneri goat is an important goat breed in Maharashtra. Sangamneri breed is a dual purpose breed (milk and meat). The average milk production is 0.859 L. per day head. However, some Sangamneri goats producing 3 L of milk/day under filed condition.

Goat milk has unique qualities over the milk of other livestock. It is nearest to human milk in its content of fat, protein and serves as good source of minerals, which make it complete food for infants. Goat milk rich source of various minerals and all these minerals are important as per the human nutrition.

Materials and Methods

Treatment Detail

Season of milking	Replication						Mean
	R-I	R-II	R-III	R-IV	R-V	R-VI	
T1							
T2							
T3							
Overall mean							
S.E							
C.D. at 5%							
Result							

T1 : Summer season (March-June)

T2 : Rainy season (July-Oct.)

T3 : Winter season (Nov- Feb)

Proximate analysis

The samples of goat milk were analyzed for their proximate composition, viz. fat, protein, lactose, total ash, titratable acidity, pH and total solids.

Results and Discussion

Fat

The average fat content of the Sangamneri goat milk was 5.23 per cent and it was ranged from 4.45 to 5.23 per cent and it was ranged from 4.45 to 5.90 per cent. The fat content of milk was significantly ($P<0.05$) affected by seasons. Significantly higher (5.71%) fat percentage was recorded during winter season followed by rainy (5.20%) and the lowest in summer season (4.80%).

Protein

The overall protein content of sangamneri goat milk was 3.61±0.09 per cent and ranged from 3.37 to 3.39 per cent. The protein content of sangamneri goat milk did not affect significantly due to seasons. The average protein content in summer, rainy and winter season was 3.50, 3.56 and 3.79 per cent respectively. The highest protein content (3.93%) was noticed in winter season while the lowest protein content (3.20%) was noticed during summer season. It is observed that protein content of sangamneri goat milk was increased from summer to winter season but non-significantly.

Lactose

The average lactose content in sangamneri goat milk was 4.06 per cent and it ranged from 3.65 to 4.38 per cent. The lactose content of milk was significantly ($P<0.05$) affected by seasons. The average lactose content in sangamneri goat milk was significantly higher in winter (4.30%) followed by rainy (4.1%) and the lowest in summer season (3.80%).

Total ash

Over the season total ash content in the sangamneri goat milk was 0.76±0.01 per cent and it was ranged from 0.72 to 0.80 per cent. The average total ash content in milk was 0.75, 0.76 and 0.77 per cent in summer, rainy and winter season respectively. There was non-significant effect of seasons on total ash content of sangamneri goat milk.

Titratable acidity

Titratable acidity irrespective of season determined in sangamneri goat milk was 0.128±0.002 and it ranged from 0.122 to 0.135 per cent. Seasons had no significant effect on titratable acidity of milk. The average titratable acidity of milk was 0.126, 0.128 and 0.132 per cent in summer, rainy and winter seasons respectively.

pH

The overall pH of sangamneri goat milk was 6.42±0.035 and it was ranged from 6.20 to 6.60. Seasons did not show any significant effect on pH of goat milk. The average values of pH of milk were 6.40, 6.42 and 6.44 in summer, rainy and winter seasons, respectively. Comparatively higher pH (6.60) was recorded in winter season.

Total Solids

The average total solids content in the sangamneri goat milk was 13.63±0.17 per cent and was in range of 12.50 to 14.30 per cent. Non-significant variation was observed in the values of total solids in goat milk due to seasons of milking. The sangamneri goat milk contained 13.50, 13.65 and 13.75 per cent total solids in summer, rainy and winter seasons respectively.

Conclusion

The overall composition of sangamneri goat milk for milk fat, protein, lactose, titratable acidity, total ash, pH and total solids was 5.24, 3.62, 4.06, 0.128, 0.76 per cent and 6.42, 13.63 per cent, respectively.

Milk fat and lactose of goat milk was affected significantly due to season. While non-significant variations were observed in total solids, protein, pH, titratable acidity and total ash content due to season.

References

[1].Agnihotri, M.K. And Prasad, V.S.S. 1992. Processing of goat milk and milk product in India. Central Institute for Research on goats, Makhdoom. pp. 212-221

[2].Fevrier, C.,Mourot,J., Jaquelin, Y., Mounier, A., & Lebreton, Y. 1993. Comparative digestive utilization of UHT goats and cows milks: nutritional effects of gelation use of a swine model. Lait, 73, 581-592

[3].Haenlein, G.F.W. 1996. Nutritional value of dairy products of ewe and goat milk. Proceedings of the IDF/Greek National Committee of IDF/CIRVAL Seminar, 159-178.

[4].Haenlein, G.F.W. 2004. Goat milk in human nutrition. Small Ruminant Research 51:155-163

Table 1: Physico-chemical content of Sangamneri goat milk as affected by season of milking (mg/kg)

Minor mineral	Season of milking	Treatment Mean	S.E	CD (0.05%)
Fat	Summer	4.80	0.12	0.35
	Rainy	5.20		
	Winter	5.71		
Protein	Summer	3.50	0.094	- (N.S)
	Rainy	3.56		
	Winter	3.79		
Lactose	Summer	3.80	0.05	0.15
	Rainy	4.10		
	Winter	4.30		
Total ash	Summer	0.75	0.01	-(N.S)
	Rainy	0.76		
	Winter	0.77		
Acidity	Summer	0.126	0.002	-(N.S)
	Rainy	0.128		
	Winter	0.132		
pH	Summer	6.40	0.035	-(N.S)
	Rainy	6.42		
	Winter	6.44		
Total solids	Summer	13.50	0.17	-(N.S)
	Rainy	13.65		
	Winter	13.75		