

THE IMPACT OF SEASON ON ASH CONTENT IN LOCAL GOAT MILK

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INTRODUCTION

Goat's milk is a great raw material for human consumption.

Goat milk like cow milk has high concentration of major nutrients in relation to caloric value. 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 centMg, 0.170 per cent K and 3.4 per cent milk protein. It provided 72 Kcal per 100 goat milk products [1, 2, 3].

In 1981, Le-Jaouen reported that goat's milk has similar vitamins contents of human milk except lower content of folic acid, Vit. C and Inositol. He added that goats butter is reputed to been effective remedy against disease such as rheumatism and arthritis [4, 5].

Goat's milk contains vitamins, minerals, trace elements, electrolytes, enzymes, proteins, and fatty acids that are easily assimilated by the body. Goat's milk has a similarity to human milk that is unmatched in cow milk and also has several medicinal values. Therefore awareness about advantage of consumption of goats milk should be popularized so that production and utilization of goat's milk could be enhanced [6].

Goats milk shows therapeutic virtues for individuals with certain dietetic problems, thus physicians have traditionally recommended goats milk for infant and others allergic to cow milk. Similarly it has been used in treatment of ulcers [6, 7].

The variation in the compositions of milk and the total yield of milk within a species depends on different factors. Some of these factors are physiological factors, genetical factors and climatic factors. Some physiological factors are stage of lactation, age, udder health and type of diet. Daily variation and season changes can be taken as the climatic factors [8, 9]. Lactation periods as well as climatic conditions are generally termed as seasonal changes which have a great influence on the milk constituents.

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 [10].

In present investigation an attempt was made to study total ash content and minerals of local goat's milk and the effect of lactation on the content of these indicators.

The ash content is a very important quality characteristic for more food, especially those of animal origin. Ash content represents the total amount of minerals present within the milk samples and major constituents in ash content comprised of oxide and chloride of mineral elements [11].

1. MATERIALS AND METHODS OF RESEARCH

1.1. Materials

Row goat milk, without added preservatives. Analyses were carried out in triplicate. Goat milk has been received from farms in the South, Center and North of Moldova, during the autumn and winter months of 2016.

Sample 1 – goat milk received from farms in the North of Moldova.

Sample 2 –goat milk received from farms in the Center of Moldova.

Sample 3 –goat milk received from farms in the South of Moldova.

1.2. Methods

Determination of Ash [12]

- Analysis procedure

Heat the crucible for 30 min in the muffle furnace set at $550 \pm 25^\circ\text{C}$. Allow the crucible to cool to 200°C . Transfer it to the desiccators and cool for 30 min, and weigh it until the two recent weights difference is within 0.5 mg.

Sample weighing: weigh 20 g with precision of 0.0001g.

- Determination

Steam the liquid samples in water bath until dryness. Place the crucible with dried or solid sample on an electric hot plate with low heat. Heat progressively until the substance

carbonizes without smoke. Transfer the crucible to muffle furnace with temperature of $(550 \pm 25)^\circ\text{C}$ and keep 4 hours. When it cools to 200°C , remove the crucible and the sample from the muffle furnace to desiccator and cool for 30 min. If carbon particle is seen in the residue before weighing, a few drops of water should be added to the sample and repeat the procedure described above.

Weigh the residue until the two recent weights difference is within 0.5mg. Calculate according to formulation 1.

$$X = \frac{M_1 - M_2}{M_3 - M_2} \times 100, (1)$$

X - the ash content of the sample with unit of g/100g;

M_1 -the weight of the crucible with the ash with unit of g;

M_2 - the weight of the empty crucible with unit of g;

M_3 -the weight of the crucible with the sample with unit of g.

2. RESULTS AND DISCUSSION

The total ash level in goat milk is slightly higher than that in cow milk 0.7 %, usually ranging from 0.70 to 0.85% [13, 14].

The results of goat milk ash content collected in the South, Center and North of the Republic of Moldova, during the autumn-winter months shows values between 0.72 and 1.44 g / 100g (Table 1).

Ash content in local goat's milk has increased significantly in samples received in December, the last period of lactation, when milk composition changed significantly compared to samples in August. A greater increase in ash content is observed in goat milk received in the south of Moldova from 0.78 to 1.44 g / 100g (Table 1).

It was observed that ash content of local goat milk significantly increased from first to last lactations.

The findings are in agreement with Aganga (2002) who studied the milk composition of 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 through out the lactation period [15].

Table 1. Ash content of local goat milk received during the autumn-winter months with unit of g/100g.

Period / Month	Geographical areas of Moldova		
	North	Center	South
	Ash content of the sample, g/100g		
August	0,72	0,70	0,78
September	0,86	0,82	0,94
October	0,92	0,84	1,01
November	0,94	0,85	1,03
December	-	0,86	1,44

*December goat milk in the north was not collected because of the interruption lactation period (bad weather).

Table 1 data show that the milk collected from different regions of Moldova has a different ash content. Therefore, goat milk from the South reported the highest values about 1 g / 100 g for goat milk collected from the central zone 0.84 g / 100g and the North of Moldova 0.81g / 100g.

Different ash content from three geographical areas may be influenced by external factors such as the type and quality of feed.

Ash content measurement is important to represent the quality, microbiological stability and nutrition in a particular food product [16].

CONCLUSIONS

Goat milk has high concentration of major nutrients in relation to caloric value and it resembles human milk in composition.

The ash content in the researched goat milk collected in the South, Center and North of Moldova according to lactation period is 0.72 to 1.44 g / 100g. The amount of ash in goat milk varies depending on the geographical area of Moldova and the lactation period.

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