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SEASONAL VARIATION OF TURCANA SHEEP MILK CHEMICAL COMPOSITION

VARIATIILE SEZONALE ALE COMPOZITIEI CHIMICE A LAPTELUI DE OAIE DIN RASA TURCANA

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Experiments were undertaken to evaluate the effect on milk chemical composition of feeding to Turcana sheep fresh forages, both in spring, summer and early autumn (April to September). Milk fat, protein and dry matter was affected by the season, the higher content was observed in August and September. The measured values in the this period was: 7,08±0,08% and 7,39±0,09%, pro tein 5,42±0,19% and 5,61±0,016%, dry matter: 19,39±0,17% and 20,73±0,92 %. Evoluating these results we conclude that is possible to utilize late summer sheep milk to maximize the content of beneficial chemical compounds of dairy products.
Key words: sheep milk, fat, protein, dry matter, lactose.

Introduction

It is widely recognized that diet plays a major role in modulating chemical composition of ruminant milk. It has also been recognized for sometime that the intake of fresh forages either cut or grazed has an influence on milk fat, protein, lactose and dry matter compared with diets based on conserved forage and concentrates (Kuzdal – Savoie and Kuzdal, 1961).

Recent studies have also highlighted that chemical composition of sheep milk is modulated by factors such as stage of forage maturity (Dewhurst et al., 2001), time interval between cutting and forage consumption (Offer, 2002) or forage conservation techniques (French et al., 2000; Chilliard et al., 2001). Therefore the wide range of chemical composition of fresh forages, its variability during the growing cycle and the changes subsequent to cutting or grazing could affect the biosynthesis of fat and protein, its uptake by the mammary gland and transfer to milk (Bauchart et al., 1984).

Results from the literature are largely focused on dairy cows and information on small ruminant species such as sheep is still scarce (Perea et al., 2000). This study was aimed at evaluation the effect of feeding fresh forages on fat, lactose, protein and dry matter of Ţurcana sheep milk.

Material and Methods

The experiment was carried out on 65 lactating mature Turcana females in a traditional private farm, Panic village, Sălaj County. Village pasture is based on self-seeding grasses.

The study started in April 2006 till September the same year. The animals were at different lactation stages. Milk yield from experimental group was measured during the last 3 day of each experimental period and samples of milk were collected to determine chemical composition. Protein, lactose and fat were analyzed using Milko Scan 705 analyzer and dry matter was determined gravimetrically.

Results and Discussions

Seasonal variation in milk fat content is presented in table 1. Variation is significant, primarily caused by summer pasture feeding and approaching lactation end.

Table 1

Seasonal variation of fat content

Month	% fat	s	V%
April	7.37±0.41	1.55	21.03
May	7.07±2.01	1.78	25.17
June	6.58±0.30	1.31	19.12
July	6.39±0.36	1.56	22.51
August	7.08±0.08	0.35	4.48
September	7.39±0.09	0.40	5.41

Fat content tends to increase during lactation as milk production decreases. Fat percent reaches a minimum June (6.85±0.30%) and a maximum in September (7.39±0.09%).

Protein content of sheep milk is shown in Table 2. Protein also varies with season, which is most important, because cheese making is dependent on casein, the main component of milk protein. Protein content changes roughly in parallel with fat content, but the seasonal variations are smaller causing high protein fat ratios (P/F) during summer and low P/F ratios in the spring.

Fat and protein content generally increase in parallel but fat varies more with season than protein.

Total protein reaches a maximum in September (5.61±0.016%).

Lactose variation of Turcana sheep milk. Compared to fat and protein, lactose content showed no remarkable seasonal changes.

Table 2

Seasonal variations of total milk protein and P/F ratio

Month	Total protein	s	V%	P/F
April	5.08±0.23	0.86	9.21	0.689
May	5.18±0.09	0.39	7.52	0.732
June	5.23±0.43	1.63	18.45	0.763
July	5.37±0.11	0.49	9.19	0.774
August	5.42±0.19	0.84	15.49	0.733
September	5.61±0.016	0.71	12.65	0.759

Table 3

Seasonal fluctuation of sheep lactose

Month	Lactose(%)	s	V%
April	4.45±0.09	0.4	8.98
May	4.56±0.04	0.17	3.72
June	4.47±0.25	0.10	24.70
July	4.44±0.08	0.33	73
August	4.39±0.04	0.12	3.80
September	4.36±0.05	0.23	5.27

The results obtained indicated the lower lactose concentration in August (4.39±0.04%) and September (4.36±0.05%) but compared in April (4.45±0.09%) the difference was not significant.

Solids in the milk increased as the season progressed.

Table 4

Dry matter content of sheep milk

Month	Dry matter (%)	s	V%
April	17.74±0.98	3.69	20.84
May	17.95±0.41	1.54	8.57
June	18.63±0.42	1.79	9.61
July	18.69±0.36	1.54	8.23
August	19.39±0.17	3.91	18.86
September	20.73±0.92	0.75	3.86

The increase of dry matter towards the end of lactation may influences the taste of milk, as it may be saltier and also affects cheese-making characteristics.

Conclusions

1. The results of present study suggest that environmental factors may be important for the quality of milk. So, it is difficult to maintain a constant and consistent production throughout the year.
2. Concentration of fat in milk is correlated positively with the stage of lactation as milk production decreases.
3. From April to September fat and protein content increase in parallel, but fat concentration fluctuates more.
4. Compared to protein and fat, lactose doesn't show remarkable seasonal changes.
5. Dry matter content increase considerably towards the end of lactation.

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