



THE LIPID COMPONENT OF EWE'S COLOSTRUM

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INTRODUCTION

Colostrum is the mammary gland secretion until 3-5 days after delivery. Besides providing immunoglobulins, maternal leukocyte, cytokine, antimicrobial and growth factors, colostrum also supplies many nutrients.

Our aim was to improve the knowledge of the nutritional quality of colostrum, we focused on the lipid component, especially on the fat globules and essential fatty acids.



MATERIALS AND METHODS

A trial was carried out on seven Massese ewes, reared on the same farm, homogeneous in terms of parity and feed, and kept indoors at 10 days before partum. Five samples were taken from each ewe after the first 10 hours post partum (day 0) to the 15th day of lactation.

The 35 individual samples were analyzed in duplicate for dry matter (DM), fat, proteins, solids-not-fat (SNF), lactose, somatic cell count (SCC), the morphometric characteristics of fat globules (FGs), and fatty acid composition.

The results were elaborated following a linear model for repeated measurements.

RESULTS AND DISCUSSION

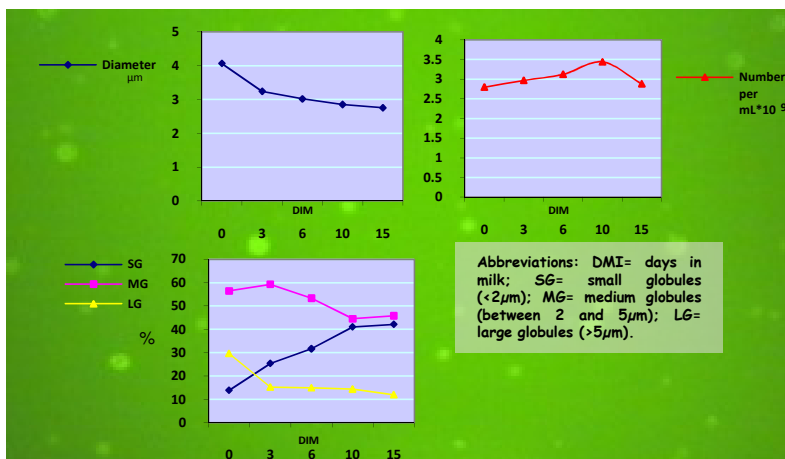
Colostrum from the first 10 hours post partum showed high contents of DM (24.58%), fat (8.21%), proteins (12.44%), SNF (16.95%), a large average diameter of FGs (4.07 μm), and high monounsaturated (36.17 % of total FAs) and essential FA percentages (C20:3, C20:4 and C22:6). Lactose (3.23%) and saturated FAs (61.67% of total FAs) on the other hand were found in lesser amounts than milk.

The occurrence of large globules (LGs) and the higher essential fatty acid content in the first colostrum have been suggested by other authors as being an adaptation of the secretion to the lack of cellular membrane to envelop the globules and to the offspring needs.

After the first day post partum the average diameter of milk fat globules decreased ($P \leq 0.01$), whereas the number of milk fat globules per mL increased ($P \leq 0.01$).

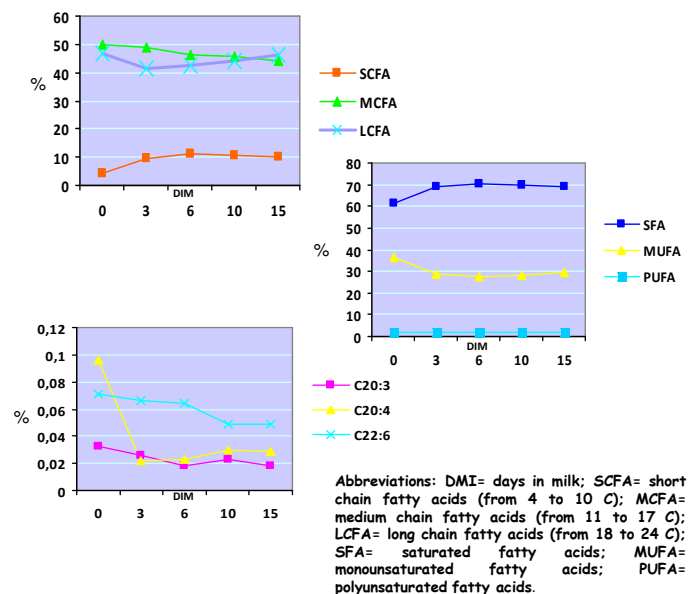
SFAs increased after the first day ($P \leq 0.05$) mostly linked to the increase in the short chains C4:0, C6:0, C8:0 and C10:0, which reached values that were almost twice or more in the first 10 days post partum (+98%, +147%, +212%, +208%). Medium chain fatty acids, particularly C16:0, MUFAs and C18:1 cis 9 (oleic acid), decreased ($P \leq 0.01$). Essential fatty acids decreased throughout the period of study, especially C20:4 which decreased considerably (-77%) after the first day.

Trends in the average diameter (μm), in the number per mL of milk and in the percentage of classes of milk fat globules during the first 15 days of lactation



In the background: Picture of the milk fat globules coloured by Acridine Orange

Trends in the classes (%) of fatty acids and in some essential fatty acids (% on total of fatty acids) during the first 15 days of lactation



CONCLUSIONS

The nutritional characteristics of colostrum seem to be represented by a physiological adaptation to the digestion, and to the requirements of the new born animal. Nevertheless, the composition of colostrum from the first day post partum changed quickly during lactation and the greatest changes in chemical and fatty acids composition were between the first and the third day.

References available from authors on request

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