

Variability of ewe's milk fatty acid profile in relation to the morphometric characteristics of milk fat globules



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INTRODUCTION

Studies carried out on bovine milk have reported that the amount of fatty acids (FAs) tends to change based on the dimensions of the milk fat globules (MFGs). This has a significant impact on the nutritional quality of milk and also leads to different technological and organoleptic characteristics of milk. The aim of this study was to verify how the FAs profile of ewe's milk is affected by changes in the morphometric characteristics of MFGs.

MATERIALS AND METHODS

The study involved the collection and analysis of bulk milk from grazing Massese ewes. The samples were taken from a dairy every week during the months of March and April and were analyzed in duplicate for morphometric characteristics of MFGs and milk FAs composition.

To verify the relationship among the parameters considered, Pearson's correlations were applied.

RESULTS AND DISCUSSION

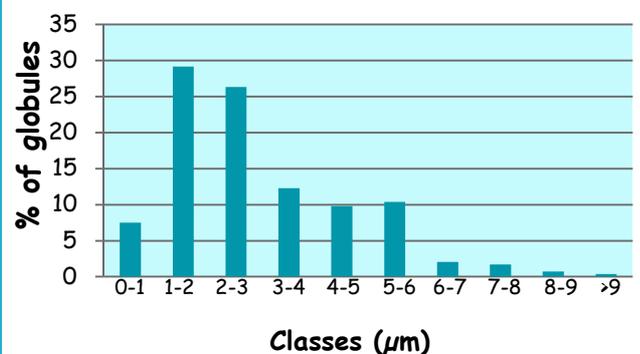
Correlations highlighted an increase in short chain FAs and in polyunsaturated FAs (PUFAs) with a higher percentage of MFGs larger than 5 μm , whereas an increase in the percentage of MFGs smaller than 2 μm was linked to a decrease in PUFAs.

An increase in the diameter of MFG was correlated to a greater content of FAs with a number of carbons from C6 to C12, of C18:1 *trans* 11 and of C18:2 c9,12.

These FAs from C6 to C10, C18:1 *trans* 11 and C18:2 c9,12 have a beneficial effect on human health, whereas C12:0 increase blood total cholesterol.

Some FAs, such as C17:0, C18:0, C20:0, C24:0 and C20:4, tended to decrease in milk with a higher percentage of MFGs greater than 2 μm . Among these FAs, C18:0 and C20:4 are essential components of cellular membranes, indeed, although C20:4 has been described as an adipogenic and pro-inflammatory factor the intake of C20:4 is necessary for membrane integrity.

Distribution of milk fat globules in ewes: percentage of globules for each class of diameter



CONCLUSIONS

In conclusion, morphometric characteristics of MFG seem to influence nutritional characteristics of milk, further studies are needed to increase the current knowledge and to develop dairy products that have better health effects.

References available from authors on request

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