

Natural content of phytosterols and α -tocopherol in milk and traditional cheeses from grazing sheep

Iolanda Altomonte, Federica Salari, Rosario Licitra and Mina Martini

Interdepartmental Center for Research in Agricultural and Environmental Sciences "Enrico Avanzi", University of Pisa, Pisa, Italy ; Department of Veterinary Science, University of Pisa, Pisa, Italy; Interdepartmental Research Center Nutrafood "Nutraceuticals and Food for Health", University of Pisa, Italy

Corresponding author: Iolanda Altomonte altomonte@vet.unipi.it

In Mediterranean zone sheep sector is mainly based on under extensive or semi-extensive management. Milk and dairy foods from grazing animals tend to have higher content of bioactive compounds. This work investigates the sterol profile and α -tocopherol content in sheep milk and cheeses also focusing on the profile of bioactive sterols of vegetal origin. The study involved a flock of Sarda sheep reared in Sardinia (Italy). In June and July 2018, every 15 days, bulk milk samples were taken for a total four samplings. In addition, two loaves of Casu Axedu (a fresh typical cheese) and of 105-day ripened Pecorino cheese produced from the same batch milk were taken. Total animal sterol content (g/100g of fat) was higher ($P \leq 0.05$) in milk compared to Casu Axedu (590.78 vs 381.87) and Pecorino showed intermediate values (425.22), while on wet basis (g/100g of product) animal sterols were more concentrated ($P \leq 0.01$) in Pecorino (122.31) with respect to milk and Casu Axedu (41.39 and 42.11). Cholesterol was the main animal sterol in all the products analysed, while the main minor sterol was lanosterol. The amount of total plant sterols ranged from 9.88 to 16.15 mg/100g of fat in milk and Pecorino cheese respectively and were for about 2-4% of animal sterols. No significant differences were found in total plant sterol content in milk and cheeses. Campesterol and brassicasterol were the main phytosterols in milk, while beta-sitosterol and brassicasterol were the most represented phytosterols in cheeses. The contents of α -tocopherol we have detected in milk, Casu Axedu and Pecorino respectively were 3.24, 1.79 and 0.89 mg/100g of fat, with the lowest values ($P \leq 0.01$) in Pecorino. This finding is probably linked to the effect of manufacture and ripening. Moreover, no significant differences were found in the content of α -tocopherol in products on wet basis (g /100 g of products). Sheep milk and dairy products may contribute to the uptake of plant sterol and α -tocopherol in human nutrition. Further studies on the variability of plant sterol content depending on the farming system could lead to a possible use of plant sterols as marker of origin.