Effects of Dietary Soybean Meal Substitution by Flaxseed and Lupins on Kefalograviera Cheese Chemical Composition - Abstract

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Summary

Recently, novel dietary strategies are under examination, aiming to improve the sensory characteristic, as well as the potential health benefits of animal products, such as cheeses produced by sheep milk. This study examined the possible changes in the chemical composition and fatty acid profile of Greek kefalograviera cheese, caused by the partial replacement of soybean meal by flaxseeds and lupins. Initially, 30 dairy ewes (Lesvos and Chios crossbreed) were fed conventional diets, based on alfalfa hay, straw and concentrate feed that contained soybean meal for a period of one month and on day 30, milk samples were collected from all animals. Then, for a period of two months the same ewes were fed a second concentrate feed with lower level of soybean meal that contacted 10% flaxseed and 10% lupins. On days 60 and 90, milk samples were collected from all animals. The milk from each collection was used to manufacture three kefalograviera cheeses (A=30-day, B=60-day, C=90-day), using commercial starter culture, rennet and pasteurized milk. After 3 months of ripening, from each kefalograviera cheese samples were taken for chemical analysis (FoodScan™) and fatty acid analysis (gas chromatography method). Cheese A had the highest fat content (A:30.5%; B: 25.6%; C:28.10%), and the lowest moisture content (A:37.9%; B:42.4%; C:39.6%) and protein content (A:26.9%; B:27.1%; C:29.1%). The fatty acid profile results showed that Cheeses B and C contained higher amounts of polyunsaturated fatty acids compared to the control (A:3.63%; B:5.76%; C:7.59%), such as linoleic acid (A:2.26%; B:3.08%; C:3.89%), alpha-linolenic acid (A:0.16%; B:0.72%; C:1.23%) and gamma-linolenic acid (A:0.49%; B:0.94%; C:1.26%). Moreover, cheeses B and C had improved omega-6/omega-3 ratio (A:18.66; B:5.75; C:4.14). In conclusion, the substitution of soybean meal by flaxseed and lupins in ewes' diets, can result in modified Kefalograviera cheese composition with improved fatty

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acid profile and potential health benefits. Future work has to be done in relation to standardize diets and omega-3/omega-6 profiles in Kefalograviera cheese.

Keywords: Dairy sheep; soybean meal; flaxseed; lupins; Kefalograviera; cheese fatty acids.

JEL Codes: N50; Q10; Q13.

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