

Fatty acid profile of milk fat in goat supplemented with iodized salt

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ABSTRACT

Iodine is an essential nutrient of the human and animal diet which is needed for the synthesis of the thyroid hormones. These hormones play an important role in the regulation of fat metabolism. In fact, increased thyroid hormone levels stimulate fat mobilization, leading to increased concentrations of plasma triglyceride (Nikkila and Kekki, 1972) and enhanced oxidation of fatty acids in many tissues. Recently, Bauman *et al.* (2006) showed the involvement of a protein called spot 14, highly responsive to thyroid hormones, in the regulation of the mammary synthesis of milk fat. However, the effects of Iodine supplementation on plasma and milk fatty acid profile in dairy animals has not been elucidated yet. The aim of this study was to evaluate if the fatty acid (FA) profile of milk changes in goats supplemented with Iodine. Thirty crossbreed dairy goats were divided into 3 groups were used and supplemented with 0 (group 0), 450 (group 1), or 900 (group 2) µg of KI/day per head. Each dose of KI (76.5% of Iodine) was orally administered in water every day for 8 weeks. Milk yield was recorded and milk samples were collected every two weeks. A total of 120 milk samples were analyzed by gas chromatography (GC). Milk yield was not influenced by treatments. Milk fat content was the highest ($P<0.01$) in group 1 (4.65%) compared to group 0 (4.15%) and group 2 (4.17%). Iodine treatments did not influence milk fatty acid profile except for the content of some short-chain fatty acids. In particular, only the contents of C8:0 FA (2.22, 2.24 and 2.12 in groups 0, 1 and 2, respectively; $P<0.01$) and C10:0 (9.74, 9.49 and 9.02 in groups 0, 1 and 2, respectively; $P<0.01$) decreased due to supplementation with the highest dose of KI. In conclusion, in this study Iodine supplementation did not show substantial effects on goat's milk FA profile, probably due to the low doses of KI used. Nevertheless, the observed decrease of some short-chain fatty acids, which are synthesized ex-novo by the mammary gland, in goats supplemented with the highest KI dose tested is compatible with a potential involvement of Iodine or thyroid hormones in the regulation of fat synthesis in the mammary gland.