

Fatty Acids Profile of Cow's Milk Produced from Alpine Grazing

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Milk from alpine grazing shows a different fatty acids profile (FA) from that produced in lowlands farms. In particular, it seems to have an increased content in Mono- and Polyunsaturated Fatty Acids (MUFA and PUFA) and a better n-6 to n-3 ratio. Conjugated linoleic acid compounds (CLA) content also seems to be enriched. The present study aimed at evaluating the effect of alpine grazing (AG), in comparison to a Total Mixed Ration (TMR) feeding system, on fatty acids profile of milk. The study took place from May to September 2006 and involved a farm which during summer move to alpine grazing (Novegno Mountain - Vicenza, North Italy). During the lowland period (P₁, May, 25) animals were fed a TMR diet, whereas during the alpine periods (P₂, July, 18; P₃, September, 5) animals were kept at pasture and received a concentrate supplement based on maize and barley. Bulk milk samples (mix of evening and morning milking) were collected 3 times throughout one week of each experimental periods (n=9). FA profile was assessed by gas-chromatography and the obtained data (% of the total detected FAME) were submitted to a one-way ANOVA; the 3 levels of fixed effect Period/Feeding system were used to calculate two orthogonal contrasts (P₁ vs P₂+P₃ and P₂ vs P₃). Results showed a significant decrease of Saturated Fatty Acids (from P₁: 62.9 to P₃: 56.6%; $P < 0.001$) and an increase of MUFA (from P₁: 25.3 to P₃: 31.1; $P < 0.001$) and PUFA (from P₁: 4.2 to P₃: 5.5; $P < 0.01$), determining also a better n-6 to n-3 ratio (from P₁: 3.6 to P₃: 2.6; $P < 0.01$), Thrombogenic (from P₁: 3.1 to P₃: 2.3; $P < 0.001$) and Atherogenic (from P₁: 2.6 to P₃: 1.9; $P < 0.001$) indexes and CLA content (from P₁: 0.8 to P₃: 2.2; $P < 0.001$). For all of these variables contrast analysis showed a significant difference ($P < 0,01$) between TMR (P₁) and Alpine grazing (P₂+P₃). These results could be explained by the higher intake of unsaturated FA when cows grazed on alpine pasture. Moreover, the increase of Unsaturated Fatty Acids during P₂ and P₃ periods was probably due to the high mobilization of body fat, as a result of the deficiency in energy intake and/or of the advanced stage of lactation. In conclusion, alpine grazing seems to enhance fatty acid profile of milk, with particular regard to those fractions of interest in human nutrition.