P143

Reduction of concentrated feed in dairy cows in the Parmigiano Reggiano area: effects on milk production and quality

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A project of technological research, funded by Emilia Romagna Region and aimed to a higher sustainability of dairy chain, involved an experimental trial testing the effect of a reduction of concentrate feed in Frisona cows producing milk for Parmigiano Reggiano Cheese making. Two groups of 15 cows each, with milk production at 9 days in milk (DIM) of 31.7 and 32.1 kg/d, were fed mixed meadow hay *ad libitum* and a growing amount of concentrate feed up to 15 kg (C group) or 12 kg (T group) at the peak of lactation (about 60 days). Milk production, milk fat and protein were recorded from each cow at 9, 47, 96, 131, 166, and 207 DIM; fatty acid composition of milk was analysed on 5 pooled samples/group at 47, 131, and 207 DIM. Milk collected from the two groups of cows at day 161 and 168 was used for micro cheese making. Milk production and milk fat were unaffected by diet, whereas milk protein was lower in T cows at 166 (3.18 *vs* 3.39%; $p<.01$) and 207 (3.17 *vs* 3.31%; $p<.05$) DIM. Fatty acid composition of T milk showed at 47 DIM significantly lower % of MUFA and PUFA, and higher % of SFA, resulting in higher SFA/UFA ratio (1.70 *vs* 1.38; $p<.01$). Both n-3 and n-6 fatty acids were significantly lower in T milk at 47 DIM (n-3: 1.21 *vs* 1.44%; n-6: 4.05 *vs* 4.57%) and at 131 DIM (n-3: 1.18 *vs* 1.37%: n-6: 3.89 *vs* 4.83%). CLA levels were similar in the milk of the two groups. The milk collected for cheese making (60 l/group) had similar chemical and bacteriological composition, with the exception of a higher content of thermophilic Lactobacilli in T milk. Rennet coagulation characteristics showed lower curd firmness at 30' in T milk (a_{30}: 24.80 *vs* 29.48 mm; $p<.05$), whereas the other cheese making traits were not significantly different between the two groups. Bacteriological traits of the ripened cheese (60 days) from the two groups were also similar.
The results of this field trial indicate that a reduction of 20% of concentrate feed in the diet of high producing cows did not affect milk amount, milk fat and cheese making traits, but caused a partial deterioration in milk protein, fatty acid composition and rennet coagulation. Further research might evaluate the whole lactation, reproductive performances, nutritional and health status.
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