

## Influence of dietary fish oil on conjugated linoleic acid, omega-3 and other fatty acids in milk fat from grazing dairy cows

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### Abstract

The main objective of this study was to evaluate the effect of supplementation with fish oil on fatty acid (FA) composition of milk fat from grazing dairy cows with particular emphasis on omega-3 and conjugated linoleic acid. Twelve dairy cows in mid-lactation were blocked by live weight, days in lactation and milk production and randomly assigned to the experimental groups corresponding to 3 different feeding regimens which were applied 3 times with 28-day duration according to a Latin square design. Cows were stocked at 2.5 heads per hectare and supplemented with 4 kg concentrate/cow/day (C), concentrate mixed with 160 g sardine oil (LFO) and concentrate mixed with 320 g sardine oil (HFO). Supplementation with fish oil (FO) resulted in a significant ( $P<0.05$ ) decrease in milk production and milk fat content and production. Supplementation with 320 g FO decreased ( $P<0.05$ ) milk protein content and production. The ratio protein/fat in milk increased with the level of FO supplemented ( $P<0.05$ ). Significant correlations were detected between some FA in milk fat and milk fat content. FO supplementation had no effect on concentration of medium chain FA but originated a decrease ( $P<0.05$ ) in concentration of short and long chain FA in milk fat. The sum of saturated FA decreased ( $P<0.05$ ) with the inclusion of FO in diet while the sum of unsaturated FA remains unchanged. Proportions of stearic and oleic FA in milk fat decreased and *trans*-vaccenic FA increase with FO supplementation ( $P<0.05$ ). Milk fat concentration of polyunsaturated n-3 FA was higher in treatment HFO. Concentration of very long chain omega FA in milk fat (i.e. C20:5-EPA e C22:6-DHA) increased by 2.7-fold with 160 g FO and by 5- to 7-fold with 320 g FO. However, the level of transfer efficiency of these FA from FO to milk fat was only 3.3% in treatment LFO and 4.0% in treatment HFO. CLA concentrations in milk fat were particularly high in this experiment and increased with the level of FO supplementation ( $P<0.05$ ).

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