

Effects of untreated and extruded linseed fed to dairy cows on rumen fermentation and plasma and milk fatty acid composition

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Heat treatment of oilseeds are used to protect both unsaturated fatty acids from ruminal biohydrogenation and ruminal microbes from toxic effects of these fatty acids. The aim of the present study was to compare the effects of untreated and extruded linseed on rumen fermentation and fatty acid composition of the plasma and milk. The experiment was designed as a cross over study with six ruminally cannulated dairy cows (155 ± 16 d in milk). The experimental periods lasted 21 d and included a 14 d adaptation and a 7 d data collection period. Aiming to supply the same amount of linolenic acid (18:3-*n*3), cows were fed daily either 1067 g ground untreated (**UNL**) or 970 g ground extruded linseeds (**EXL**) in addition to 18 kg of hay. The linseeds were offered in a mixture with wheat bran and molasses. During the data collection period, feed intake as well as milk yield and milk components were recorded daily. Rumen fluid and venous blood were sampled on d 1 and 7 of the data collection period. The total dry matter (DM) intake was not ($P > 0.05$) affected by the treatments whereas the intake of total fatty acids (654 vs. 664 g/d) was lower ($P < 0.01$) and the intake of 18:3-*n*3 (318 vs. 317 g/d) was slightly higher ($P < 0.05$) in EXL compared to UNL. The concentration of ruminal microbes and total volatile fatty acids did not ($P > 0.05$) differ between treatments. However, feeding EXL instead of UNL increased ($P < 0.05$) the acetate to propionate ratio in the rumen, which might explain the higher ($P < 0.05$) milk fat content with treatment EXL. The concentration of ruminal ammonia was higher ($P < 0.05$) and the concentration of urea-N in the milk was lower ($P < 0.01$) in cows fed UNL compared to cows fed EXL. Although in the plasma the 18:3-*n*3 concentration was higher ($P < 0.01$) in EXL than UNL, the 18:3-*n*3 concentration in the milk did not differ ($P > 0.05$) between treatments. The apparent transfer efficiency of 18:3-*n*3 from feed to milk (3.7 %) was not ($P > 0.05$) affected by the dietary treatments. The present results indicate that extrusion of linseed seems not to be a suitable technological treatment to increase the level of 18:3-*n*3 in the milk fat.

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