

An energy-protein feed additive containing different sources of fat improves feed intake and milk performance of dairy cows in mid-lactation

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Summary

This research paper addresses the hypothesis that calcium salts combined with whole linseed and heat-treated rapeseed cake in one feed additive may efficiently stimulate the productivity of dairy cows and have a positive effect on the functional properties of milk fat. The article proposes the composition of such an additive (EFA) and evaluates its nutritional effect in the diet of mid-lactation dairy cows. Forty multiparous Polish Holstein-Friesian (PHF) dairy cows were allocated to one of four treatments (10 cows/treatment) and fed a TMR diet without EFA or with EFA in the amount of 1, 2, or 3 kg/d per head for a 63-day-period. Individual intake of dry matter (DMI) and nutrients was determined, as was milk yield and composition, including fatty acid profile, fat soluble vitamins, cholesterol and phospholipids (PLs). Cows fed diets with EFA had higher ($P<0.05$) DMI, milk yield and milk vitamin D₃ and K₂ concentration but lower ($P<0.01$) milk protein, fat and cholesterol contents. EFA did not affect the milk concentrations of β -carotene or vitamin A or E. The PLs content was correlated with fat concentration in the milk and decreased as the level of EFA in the diet increased. An increase in phosphatidylcholine in total PLs was accompanied by a reduction in the proportion of sphingomyelin ($P<0.05$). The use of EFA increased the proportion of polyunsaturated fatty acids (PUFA) in the total fatty acids in the milk. EFA in the amount of 3 kg increased the proportion of PUFA by 77% ($P<0.05$). In conclusion, the use of an energy-protein feed additive (EFA) increases feed intake and milk yield in cows and alters milk fat composition, improving its functional properties. Higher milk production compensates for the decrease in solids concentration in the milk, which has no effect on daily yield.