

Milk fat depression in dairy ewes fed fish oil: Effects of rumen biohydrogenation, fermentation, and bacterial community

Whereas sheep milk production is still a minor industry in Germany, other European countries have a long tradition in keeping dairy ewes and producing sheep milk products. As in other species, milk composition is depending on ingredients of the feeding ration. Diet-induced milk fat depression (MFD) is commonly observed in sheep fed with marine lipid supplements to modulate milk fatty acid (FA) composition. However, dairy ewes show large individual variation in the extent of this condition. Thus, the Institute of Livestock of Montaña, Spain, hypothesized in this here summarized publication that alterations in the processes of rumen biohydrogenation and fermentation, as well as in the bacterial community composition might account for individual variation in fish oil-induced MFD and its severity.

To test this hypothesis, 15 ewes received a total mixed ration without lipid supplementation, and supplemented with 20 g of fish oil/kg of dry matter for 5 weeks in 3 groups containing control ewes. Before and after treatments, researchers collected rumen samples and analyzed rumen fermentation parameters, biohydrogenation metabolites, and bacterial composition and diversity. None of the investigated factors differed significantly with regard to the extent of milk fat depression, though. Researchers observed changes in total volatile FA and acetate, and propionate concentrations were associated with MFD severity, with higher decreases in more susceptible animals.

Overall, as the Institute of Livestock of Montaña explains, the results suggest that individual variation in MFD severity in dairy ewes fed fish oil cannot be fully explained by differences in the processes of rumen biohydrogenation and fermentation or in the bacterial community. They also admitted that reasons behind this variability remain uncertain and further research is still necessary to explain individual variation in the extent of this syndrome.

Our conclusion: Regarding to large individual variation in the extent of diet-induced milk fat depression in dairy ewes shown in former and in this study, it would be valuable for farmers to see how and under which conditions fish oil-induced diet can cause milk fat depression in detail. It has to be noted that the number of ewes in this study was limited. Thus, further research with a larger number of ewes or including genetic analyses may help to elucidate the phenomenon of fish-oil induced MFD in dairy ewes. (ag)

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