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POSTERS THEME C

Does *Camelina sativa* contamination of double low rapeseed expellers cause milk fat depression in dairy cows?

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Background: Expellers and press cakes of double low *Brassica napus L* rapeseed (RPCs) are normally recognized as valuable parts of the concentrate feed to dairy cows. However, during spring 2013 milk fat depression was observed among some high yielding Danish dairy herds fed commercial RPC's containing 13-14% fat as part of their feed. The observed milk fat depression varied, showing depression up to 0.5 % units.

Objectives: The objectives of the present study were identification and evaluation of possible correlations between bioactive constituents in the applied feed and the dairy cows' milk fat depression.

Methods: Nine RPC containing samples from feed fed to nine different milk fat depressed herds were collected, analyzed and the analytical data were compared with corresponding data from six reference groups of herds without milk fat depression. The RPC samples were analyzed for protein, fat, fatty acids (FA's), phenolics and glucosinolate content.

Results and discussion: The RPC containing samples did not differ significantly in protein content and total fat content. RPC's in feed fed to milk fat depressed herds differed, however, from that of the reference feed with respect to FA composition. They were thus higher in C18:3n-3 (12.1% vs 8.9%), C20:1n-9 (2.7% vs 1.1 %), C22:1n-9 (0.7% vs 0.1) and lower in C18:1n-9 (51.5% vs 57.4%).

With respect to phenolics and glucosinolates, some striking differences were seen in the profiles of individual compounds; the flavonoids (especially quercetin glycosides) and ω-(R)-methylsulfinylglucosinolates.

RPC's from milk fat depressed herds showed a characteristic content of 4 different ω-(R)-methylsulfinylglucosinolates (n=8, 9, 10 and 11) varying in total concentrations from 0.7-3.3 µmol/g RPC's. Seeds of high quality double low *Brassica napus L.* only contain ω-(R)-Methylsulfinylglucosinolates with n=4 (glucoraphanin) and n=5 (glucoalyssin) and in low concentrations (0.1-0.2 µmol/g seed). Seeds of *Camelina sativa (L.)* Crantz, however, accumulate appreciable concentrations of the 4 homologues with long side chains; n=8, n=9, n=10 and n=11(Das et al., 2014, Andersson et al., 2008) with total concentrations from 10-30 µmol/g seed depending on variety.

The observed milk fat depression was very similar to the milk fat depression caused by conjugated linoleic acid (CLA), but although the content of unsaturated FA was higher in RPC samples from milk fat depressed herds it was not considered to be high enough in the total diet to cause milk fat depression. However, based on the quantitative analysis of FA, phenolics and glucosinolates in double low rapeseed and *Camelina sativa* seeds, it seems more likely that the observed milk fat depressions are caused by RPC's contaminated with around 15-20% of *Camelina sativa* seeds.

Conclusions: The cause of the milk fat depression is not completely elucidated, but it is likely that it is caused by a contamination with *Camelina sativa*, but whether it is caused by the glucosinolates or other compounds in *Camelina sativa* seeds still needs to be resolved.

Implications: This study shows the importance of natural product fingerprints as an important means to detect adulteration of feed impairing significantly on animal metabolism and thereby on their production yields.

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