

## Transport of *Trans* Fatty Acids in Dairy Cows

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Ruminant derived foods contain *trans* fatty acids (tFA) that originate from partial ruminal biohydrogenation and are of interest due to their biological effects and potential role in human diseases. The objective of the present study was to compare fatty acid profiles of plasma HDL and LDL lipoprotein fractions in cows subjected to ruminal infusions of soya oil (SO; to induce high vaccenic acid; VA; *trans*-11 C18:1 absorption) or partially hydrogenated vegetable oil (PHVO) containing high concentrations of several tFA (*trans* 4 to *trans* 12 C18:1). Three non-lactating Holstein nuliparous cows [BW 773 ± 63 kg (average ± SD)], each with a rumen cannula were utilized in a 3 x 3 Latin square design with 3 d infusion periods followed by a 4 d washout interval between treatments. The cows were infused with: 1) skim milk (control; 500 mL/d); 2) SO (250 g/d in 500 mL skim milk) and 3) PHVO (250 g/d in 500 mL skim milk). Plasma samples were collected for determination of fatty acid concentrations in lipoprotein fractions on each day of infusion. No difference was observed between treatments in classes of FA except for tFA. Compared with control and PHVO, SO had higher concentrations of tFA in plasma and lipoprotein fractions. No effect on individual FA of plasma samples was observed between treatments except for 18:1 *trans* 4 and between 18:1 *trans* 9 to 18:1 *trans* 12. SO had higher concentrations of 18:1 *trans* 5, *trans* 10, *trans* 11 and *trans* 12 and lower concentrations of 17:0, 18:1 *trans* 4, *trans* 9 and 22:3n6 compared with PHVO. Differences in *trans* 18:1 isomers were observed in HDL- and LDL-fractions accompanied by interactions between them. The results of this experiment demonstrate that tFA concentration of plasma and lipoprotein fractions can be changed by dietary lipids. There is clear evidence that transportation of tFA varies depending on the dietary lipid and the lipoprotein fraction.