Milk fatty acid profile in goats receiving high forage or high concentrate diets supplemented, or not, with either whole rapeseeds or sunflower oil.

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Sixteen multiparous mid-lactation goats received 4 diets differing in either forage:concentrate ratio (HF-64:36 or LF-43:57) and/or lipid intake (0 vs. 130 g lipid/d, i.e. 4% of diet DM, from either whole rapeseeds, RS, or sunflower oil, SO) in a 4x4 Latin Square design. After 3 weeks of treatment, milk yield was lower (P<0.05) with HF-RS than other diets (3.85 vs. 4.24 kg/d) and milk fat content was higher with HF-RS or LF-SO compared with HF or LF diets (38.5 vs. 32.4 g/kg). Oleic acid in milk fatty acids (FA) was much higher with HF-RS than other diets (22.7 vs. 14.6%) whereas trans-18:1+trans-18:2 isomers were much higher with LF-SO (14.5%, incl. 7.7% vaccenic and 3.5% rumenic acids) than other diets (3.7%). Lipid supplementation decreased largely 12:0, 14:0 and 16:0 (-27%). HF-RS diet maximized the 18:3n-3/18:2n-6 ratio (0.46) whereas LF-SO minimized it (0.13). In conclusion, the studied dietary treatments strongly changed goat milk FA profile. High forage plus whole rapeseeds diet is very efficient to increase oleic acid and n-3/n-6 ratio, and to decrease saturated FA content of goat milk fat. Goat’s responses to starch- and PUFA-rich diets differ markedly from cow’s ones, particularly by the high milk fat yield response and the low level of trans10-18:1 and other “non-trans11” biohydrogenation intermediates. (Work funded by the LIPGENE EU-FP6 Project, www.lipgene.tcd.ie).