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Spontaneous lipolysis results in the breakdown of milk fat by the lipoprotein lipase (LPL; EC 3.1.1.34), an enzyme present in milk. Subsequent release of free fatty acids (FFA) in milk can affect the organoleptic value of milk and dairy products (rancidity, off-flavor). Feed restriction was used as a model for studying milk lipolysis and its mechanisms in 3 species of dairy interest (cow, goat and ewe) within the frame of the LIPOMEC project (ANR-19-CE21-0010). We have recently demonstrated that feed restriction in the cow increased both milk FFA levels and LPL activity (Hurtaud et al, 2023, Animal - Open Space 2, 100035), whereas a similar dietary restriction caused a decrease in milk FFA levels by more than 50 % in the ewe species without affecting the LPL activity in milk (Bernard et al, *in revision*). We conducted a similar feed restriction study in the goat species. Two groups of 12 dairy goats (121 ± 7 days in milk) balanced with regard to the αs1-casein (CSN1S1) genotype (7 A/A goats (strong CSN1S1 genotypes producing milk with high levels of αs1-casein) and 5 O/O goats (*null* CSN1S1 genotypes)) received either a control diet (100% of the dry matter intake (DMI) ad libitum: unrestricted; NR) or the experimental diet (65% of the DMI ad libitum: restricted; R) according to a 2 X 2 cross-over design. The duration of the restriction was 5 days. Statistical analyses including effects of genotype, diet and genotype x diet interactions were performed using R software. DMI intake decreased by more than 25 % in the R goats compared with the NR goats (P=0.031). At the same time, milk yield decreased (-11 % and -12 % for A/A and O/O goats respectively, P<0.001) together with milk fat and protein yields (P<0.001). However, dietary restriction in goats did not significantly affect FFA levels in milk nor milk fat globule size, whereas a sharp decrease in milk LPL activity was observed (-33 % and – 34 % for A/A and O/O goats respectively, P<0.001) without genotype x diet interaction. Overall, our results highlight a species-specific response to feed restriction with regard to FFA levels and milk LPL activity. Further studies are under way to better understand molecular mechanisms involved in the regulation of milk lipolysis in ruminant species of dairy interest.

KEYWORDS
milk fat, free fatty acids, dairy species