Body reserve dynamics using metabolites and hormones profiles of Romane ewes in two farming systems

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The objective was to monitor the main effects affecting body reserve (**BR**) mobilization and accretion, using metabolites and hormones profiles, in Romane ewes reared under two contrasting farming systems (**FS**; (indoor, **IND**; extensive, **OUT**)). The ewes (n=173 IND; n=234 OUT) belonged to two genetic lines selected for low or high residual feed intake. They were monitored during their two first productive cycles at five key physiological stages (Mating, **M**; mid-Pregnancy, **P**; 2 weeks Pre-Lambing, **bL**; 3 weeks Post-Lambing, **aL**; Weaning, **W**). Parameters included body condition score (**BCS**) and metabolic profiles for plasma concentrations on non-esterified fatty acids (**NEFA**), β-hydroxybutyrate (**BHB**), Triiodothyronine (**T3**) and insulin (**INS**). The relevant fixed effects and their interactions were investigated through analyses of variance using *R*. Physiological stage, parity, cohort, genetic line, and litter class were fixed effects while ewe and residuals were random effects. Depending on the parameter evaluated, the fixed effects and their interactions, with the exception of the genetic line, were statistically significant ($P < 0.05$). Regardless of the FS, results showed that BCS increased until P and declined thereafter. Highest NEFA concentrations were found from bL until W and at W in ewes reared IND or OUT, respectively. Significantly higher BHB levels than those found in M, P, and W were found in bL and aL ewes in both FS. T3 displayed a similar high trend throughout the stages with a peak at aL, and INS increased from P to aL before declining thereafter whatever the FS. These findings indicate that BR mobilization was displayed between P and W, as evidenced by BCS and blood parameters, whereas BR accretion occurred between W to P. Overall, there seems to be a consistent trend in Romane ewes' capacity to mobilize and recover their BR irrespective of the FS. Plasma concentrations of metabolites and hormones at different physiological status can be an indicator of the ewe's metabolic plasticity.