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Session 65

Individual adaptive responses of meat ewes facing an abrupt nutritional challenge after lambing

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Simulating a climate change event, responses of Mediterranean meat ewes when facing an abrupt nutritional challenge (**NC**; i.e. fed with cereal straw of very low nutritional value only) were studied at a very sensitive physiological stage (i.e. just after lambing). Forty Romane ewes were chosen at early-mid pregnancy (around 2 mo) according to parity (20 primiparous, **PRIM**; 20 multiparous, **MULT**); feed efficiency genetic line [residual feed intake (**RFI**); inefficient, RFI-, n= 10 per parity; efficient, RFI+, n= 10 per parity); litter size (i.e. bearing twins, diagnosed by ultrasonography); and **BW** and body condition score (**BCS**) [initial **BW** and **BCS** (mean \pm SD): 51.6 \pm 7.41 kg; 2.5 \pm 0.20, respectively; representing average **BW** and **BCS** of their parity in the flock]. Effects on intake, ewes' **BW** and **BCS**, subcutaneous back-fat thickness (**BFT**), energy metabolism [plasma **NEFA**, β -**OHB**, glucose, urea, tri-iodothyronine (**T3**)], and lambs' growth were examined before, during and after **NC**. Individuals' profiles of the response-recovery of each ewe to **NC** were described using a piecewise mixed-effects model and clustered using principal components analysis and Euclidean distance. **MULT** presented sharper β -**OHB** recovery from **NC** than **PRIM** ($P \leq 0.05$). Parity or genetic line did not affect the other evaluated traits. Clusters of individuals' response-recovery to **NC** suggested three different adaptive strategies to **NC** (i.e. adaptation on acquisition, allocation or trade-off between acquisition and allocation of energy). Interestingly, ewes' response-recovery to **NC** demonstrated also to be related to lamb average daily gain (**ADG**, g/d), especially plasma β -**OHB** and **NEFA** ($r \geq 0.50$). Results provide new insights in how such short and abrupt **NC** affect some key physiological parameters, and to what extent the impacts of **NC** and the ewes' potential response-recovery are influenced by the individual nature of the animals (i.e. observed inter-individual differences in the responses). This work was financed by the PRIMA ADAPATHERD project (<https://www.adapt-herd.eu/>).