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► To cite this version:

Anne de La Torre, Fabienne Blanc, Pascal P. d'Hour, Jacques Agabriel. Nutritional trajectory allows to increase the efficiency of beef cows whatever their body conditions. 65. Annual Meeting of the European Federation of Animal Science (EAAP), European Association of Animal Production (EAAP). DNK., Aug 2014, Copenhagen, Denmark. 485 p. hal-02738703

HAL Id: hal-02738703

<https://hal.inrae.fr/hal-02738703v1>

Submitted on 2 Jun 2020

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Underfeeding/refeeding trajectory allows to increase the efficiency of beef cows whatever their body condition

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Feed costs represent the largest operating costs in beef production, one way to increase profitability is to improve the use and efficiency of energy intake. The objectives of this work were to i) characterize the energetic efficiency of cows experiencing 2 nutritional trajectories after calving and ii) to determine the effect of body condition score at calving (BCS_c , scale 0–5) on this efficiency. This latter was estimated by the residual energy expenditure (E_{resid}) which accounts for the net energy available for other expenditures than milk and tissue growth; E_{resid} (in MJ/d/kg $BW^{0.75}$ in NE for lactation) = $E_{intake} - (E_{milk} + E_{retained\ in\ tissues})$. E_{resid} was calculated in 40 cows differing in BCS_c (moderate, M vs. fat, F) experiencing 2 energy trajectories during the first 120 days post-partum period (P1): Control level (FC (n=9) and MC (n=9) vs Low level (FL (n=9) vs ML (n=10)). During Period 2 (P2, 120-196 days post-partum) all cows were turned out to pasture. BW, body condition and milk production were measured in P1 and P2. Body lipids reserves of each cow were assessed 3 times over the experiment by measuring subcutaneous adipose cells diameter. Milk production was similar between the 4 groups of cows. Over P1, FL and ML cows lost 25 and 43 kg respectively compared to FC and MC cows. E_{resid} was 25% lower in L than in C cows ($P < 0.05$) whatever their BCS. Over P2, BW and BCS gains were similar in FL and ML cows. At the end of P2, FL and ML cows weighed 20 and 10 kg less than FC and MC cows. Over P1+P2, the difference in E_{resid} between the 2 nutritional trajectories was 23% in both F and M cows ($P < 0.05$). These results showed that lean cows submitted to an underfeeding/refeeding trajectory present similar abilities to withstand nutritional perturbations than fatter ones. E_{resid} changes could be interpreted as an indicator of cows' efficiency within a nutritional trajectory.