

**Effect of peri-implantational undernutrition on the dam and offspring performance in two beef breeds**

A. Noya, I. Casasús, J.A. Rodríguez-Sánchez, J. Ferrer and A. Sanz

Centro de Investigación y Tecnología Agroalimentaria (CITA) de Aragón, Avda. Montañana 930, 50059 Zaragoza, Spain; [anoya@cita-aragon.es](mailto:anoya@cita-aragon.es)

Undernutrition in early pregnancy, which is common in extensive beef cattle systems, can affect foetal development and postnatal performance. This study analyzed the effect of dam undernutrition in the first third of pregnancy on dam and calf performance in two beef breeds. Forty-nine Parda de Montaña (PA) and 32 Pirenaica (PI) multiparous cows were inseminated and allocated to a control (CONTROL, n=35) or nutrient-restricted (SUBNUT, n=46) diet, which met 100 or 65% of their estimated energy requirements during the first 82 d of pregnancy, and thereafter received a control 100% diet until parturition. Animals were weighed fortnightly. On d 23 post-calving, dams were machine-milked to determine milk yield and composition. On d 25 and 120 (weaning), calf milk intake was determined by the weigh-suckle-weigh technique. Dam weight at calving was not influenced by breed or nutritional treatment (599 kg,  $P>0.05$ ), but body condition score was higher in PI cows (2.66 vs 2.87 in PA and PI,  $P<0.001$ ). Peri-implantational undernutrition did not affect calf birth weight, but PA calves were heavier (45.8 vs 40.9 kg,  $P<0.001$ ). At d 23 milk yield tended to be higher in PA than PI cows (9.7 vs 8.6 kg/d,  $P=0.06$ ), and PI had greater fat, fat-free dry matter and lactose content ( $P<0.001$ ) than PA. Surprisingly, milk fat content was lower in CONTROL than SUBNUT cows (4.4 vs 4.9%,  $P=0.02$ ). Calf milk intake was higher in PA than PI calves ( $P<0.001$ ) both at d 25 (9.3 vs 7.9 kg/d) and at weaning (7.3 vs 5.7 kg/d), but it was not affected by dam nutrition. The correlation between the yield obtained by machine milking and calf milk intake in the first month was 0.46 ( $P<0.001$ ), and the latter was correlated with calf gains in the whole lactation (0.65,  $P<0.001$ ), calf milk intake being a good predictor of weaning weight. Calf gains during lactation did not differ between nutritional treatments in PA calves, but gains of PI-CONTROL were higher than those of PI-SUBNUT (0.88 vs 0.70 kg/d). In conclusion, peri-implantational undernutrition increased milk fat content in dams, and reduced offspring growth in PI breed, probably due to a higher sensitivity of this breed to maternal undernutrition.

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**Performance of weaned dairy bull calves fed concentrate or free choice of concentrate and TMR**

A. Jensen, C. Juhl, N. Drake, M.B. Jensen and M. Vestergaard

Aarhus University, Department of Animal Science, Foulum, 8830 Tjele, Denmark; [mogens.vestergaard@anis.au.dk](mailto:mogens.vestergaard@anis.au.dk)

In rosé veal calf production, transition from a liquid-based milk replacer diet to a dry feed-based diet poses a potential risk; calves not only change diet but are often shipped, mixed, or re-grouped before weaning. Some rosé veal farms feed calves a total mixed ration (TMR) from weaning, while others feed pelleted concentrate or a combination of both. The objective of this study was to test how weaned dairy bull calves performed from 10 to 18 wk of age when offered either a pelleted concentrate (PELL) or free choice between pelleted concentrate and TMR (FREE). A total of 32 calves were purchased from 3 dairy herds at  $12\pm 1$  days of age and  $48\pm 1$  kg LW (Mean $\pm$ SE). Until weaning at 8 wk of age, calves were offered a total of 224 L milk replacer (21% CP, 20% fat). Until 10 wk of age, calves had free access to a pelleted concentrate (19% CP) and artificially-dried chopped hay (14% CP). Milk and concentrate intakes were recorded individually via automated feeders. At wk 10 ( $95\pm 2$  kg LW), calves were assigned to either PELL or FREE. The pelleted concentrate and the TMR had (kg DM basis) similar NE (7.9 MJ), CP (218 g), and starch content (335 g), but varied in DM (87 vs 70%). A total of 31 calves completed the experiment. During wk 10-18, hay comprised 8.8% of DMI for PELL and 2.6% for FREE, while TMR intake comprised 43% of DMI from pellets+TMR for FREE calves. Concentrate intake was 4.25 and 2.76 kg DM/d ( $P<0.001$ ) for PELL and FREE, respectively. TMR intake was 1.98 kg DM/d for FREE calves. LW at 18 wk of age was 181 and 175 kg ( $P<0.32$ ) and ADG from wk 10 to 18 was 1.54 and 1.41 kg/d ( $P<0.31$ ) for PELL and FREE, respectively. The lower concentrate intake of FREE may pose a risk of a lower growth rate compared with PELL but this could not be confirmed in the present study. Any long-term consequences for growth, feed utilization, and carcass value also need to be studied.