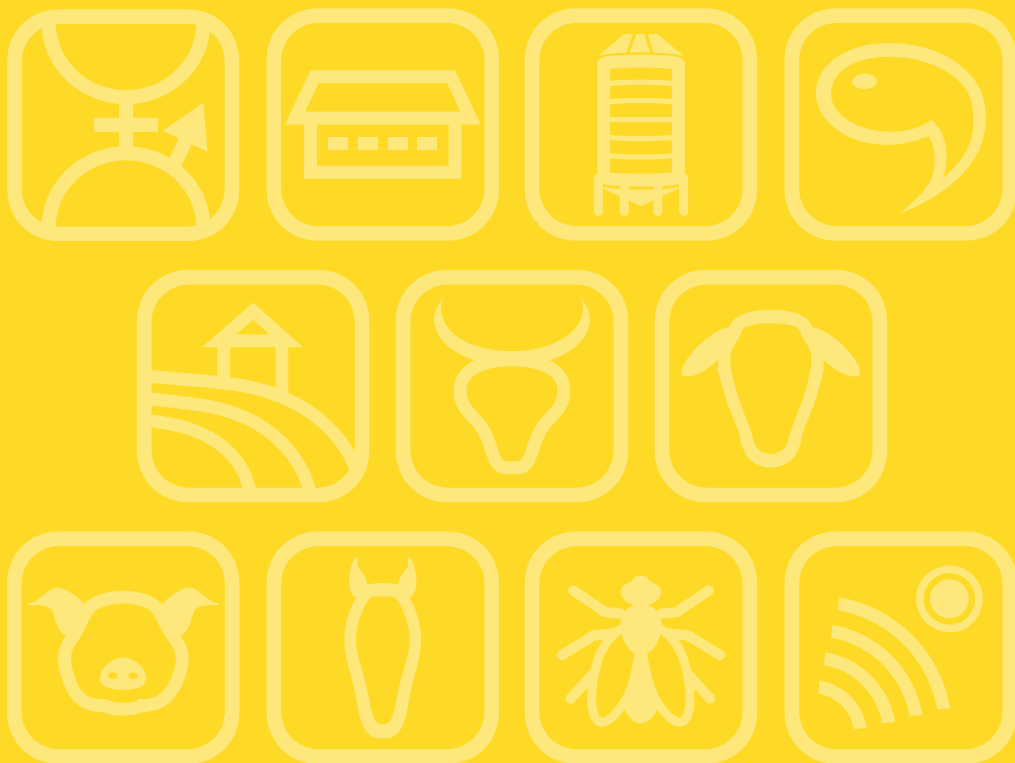


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Maternal nutrition carry-over effects on beef cow colostrum but not on milk fatty acid composition

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Prepartum nutrition (60 vs 100% their energy requirements during 3 months before calving, LOW vs HIGH) effects on beef cow colostrum and milk fatty acids (FA) profile were evaluated (n=80 cows, half from Parda de Montaña and Pirenaica beef breeds). The postpartum cows were fed 100% their energy requirements (0.7% of total FA, 37.1% C18:2 n-6, 29.8% C16:0, 12.9% c9-C18:1, 9.7% 18:3 n-3). Colostrum was manually milked <12 h post-partum and milk was machine milked by oxytocin technique at week 3 post-partum. Samples were freeze-dried, and FA were analysed by gas chromatography using C11:0 as internal standard and reference standards to compare identified peaks. In colostrum, de novo synthesized saturated FA (SFA) (C4:0 to C15:0) content were lower in LOW than in HIGH fed cows (17.73 vs 21.31±0.41%, $P<0.001$) whereas odd-chain SFA were higher in LOW than in HIGH fed cows (1.98 vs 1.77±0.04%, $P<0.001$). Desaturase index was higher in LOW than in HIGH fed cows ($P<0.001$), leading to greater total trans- and cis-monounsaturated FA (MUFA) in LOW than in HIGH cows (2.05 vs 1.51±0.07%, 26.32 vs 21.35±0.52%, $P<0.001$). Polyunsaturated FA (PUFA) n-3 were higher in LOW than in HIGH cows (2.26 vs 1.96±0.08%, $P<0.001$), mainly as a result of greater C18:3 n-3, whereas PUFA n-6 did not differ across groups ($P>0.05$). Likewise, colostrum ruminic acid content was higher in LOW than in HIGH cows (0.97 vs 0.71±0.031%, $P<0.001$). The c9-C18:1/C15:0 ratio, which is a proxy of negative energy balance, was higher in LOW than in HIGH cows (27.8 vs 20.4±0.99, $P<0.001$). However, total FA in colostrum did not differ across pre-partum feeding levels (4.64±0.52%, $P>0.05$). Subsequently, there were no differences between treatments in any milk FA group, except in total PUFA n-3, that were lower in LOW than in HIGH cows (0.85 vs 0.93±0.03%, $P<0.05$), although C18:3 n-3 did not differ anymore. The total FA in milk did not differ across pre-partum feeding levels either (3.71±0.10, $P>0.05$). In conclusion, when the cows were underfed during the last third of pregnancy, less SFA but more MUFA and essential PUFA were found in colostrum. Later, the milk FA differences were nearly vanished.

Different types and doses of colostrum to optimize the passive immune transfer and health in lambs

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Optimizing the artificial rearing of young ruminants represents a challenge in modern dairy production systems. However, access to sufficient quantity and quality of colostrum represents a limitation in many farms, which can lead to failure in the passive immune transfer. The objective of this experiment was to investigate the effects of a vacuum-dried bovine colostrum powder (BCP) on the health and of lambs. At birth, fifty-five newborn lambs were separated from their dams and randomly divided into five experimental groups (n=11). Animals received equal volumes pooled ovine colostrum (OC), pooled bovine colostrum (BC), reconstituted BCP at medium (BCPM) or high dose (BCPH). All these lambs received artificial milk feeding whereas a fifth group of lambs sucked maternal colostrum (in unknown quantities) followed by a natural lactation on de dam as control (CTL). Colostrum was provided by oro-gastric intubation at 2 h (6% of BW) and 6 h (6% of BW) whereas at 12 h after birth lambs received milk a similar dose of milk replacer (except for the BCPH which received BCP). Blood samples were collected at 0, 1, 3, 14, 45 and 52 days of age to monitor plasma metabolites. Results showed a greater IgG concentration in OC than in BC or BCP resulting on a higher IgG intake. All artificially reared lambs (OC, BC, BCPM and BCPH) showed a similar concentrations of IgG at 24 h of age leading to a lower efficiency of IgG absorption for the OC and BCPH treatments ($P=0.09$). No differences were noted among these treatments in terms of plasma metabolites, health and productivity. The presence of anaemia due to the use of heterologous colostrum was discarded. However, CTL lambs had 1.8 to 2.0 times higher serum IgG concentration than artificially reared lambs when measured by ELISA or refractometer, respectively. Control lambs also had lower incidence of diarrhoea and higher BW gain during the post-weaning period. In conclusion, the use of pooled OC, pooled BC or bovine colostrum powder can be considered as successful strategies to artificially rear ruminants, despite maternal rearing provides extra health and productive benefits.