

Do transition milk and colostrum feedings provide benefits to dairy calves' gastrointestinal tract after transportation?

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Bovine colostrum (**BC**) and Transition milk (**TM**) are rich in nutrients and bioactive molecules, which may help calves to recover digestive tract functionality from stressful periods such as marketing and transport. The objective of our study was to evaluate the digestive tract recovery of feeding either BC, TM, or milk replacer (MR) transportation. In this conference, we will assess our objective through fecal biomarkers of immune response and microbiota. The transportation was simulated by restrictive feeding 2L of an oral rehydration solution twice daily for 3 d and 19 h of fasting to 35 male calves (22 ± 4.8 days old) and then randomly assigned the calves to one of 5 treatments (n=7; d 1 of study): feeding either pooled BC during four (**C4**) or ten (**C10**) days, pooled TM during four (**TM4**) or ten (**TM10**) days, or MR for ten days (**CTRL**) at the rate of 720 g/d DM content in a total volume of 3L. After, all calves were fed the same feeding program, decreasing MR gradually from 3L twice daily to 2L once daily at 12.5% DM until weaning (d 42 of study). Concentrate feed, water, and straw were offered *ad libitum*. Feed, MR, and straw intake were recorded daily, and body weight on d -3, 1, 2, 5 and 11, and weekly afterwards. Volatile fatty acids, IgA and microbiota (Firmicutes to Bacteroidetes ratio and *Faecalis prausnitzii*) were analyzed in feces from samples obtained on d 5 and 11 before the morning feeding. Calf performance, intake, and microbiota quantification were similar among treatments throughout the study. Fecal IgA concentrations were greater ($P < 0.05$) in C10 than in CTRL, TM4, and TM10 calves, and in C4 and TM10 than in CTRL animals. Fecal propionate proportion was less abundant in C10 calves than in CTRL, TM4 and TM10 ones, while butyrate was greater in C4 and C10 calves than in TM4 and CTRL ones.

Take home message: TM and BC provide gut immune protection and BC may promote butyrate-producing bacteria in calves after transportation.

Effects of weaning strategies on health, hematology, and productivity in Holstein dairy calves

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Weaning strategies in dairy calves vary considerably, though the impact on animal health is unclear. This study examined the effects of calf weaning age (6 vs. 8 wk) and pace (abrupt vs. gradual) on health parameters in dairy calves. Holstein calves (n = 72), blocked by sex and birth weight, were randomly assigned to one of four treatments (n = 18 per): Early-Abrupt (EA), Early-Gradual (EG), Late-Abrupt (LA), and Late-Gradual (LG). Milk replacer (24% CP, 17% fat; up to 1200 g/d) was fed twice daily; water, calf starter (18% CP), and chopped alfalfa hay were fed *ad libitum*. Body weight, health measures, blood hematology, and fecal scores were obtained prior to, and after weaning. Calves were orally bolused with a rumen pH logger for the last three days of the weaning transition and rumen pH was measured continuously. Calves also had fresh blood analyzed using an HM5 hematology unit during weaning to determine immune function. Age at weaning increased respiration, while gradual weaning groups had lower respiration rate. Heart rate was lower in gradual than in abrupt groups. Fecal score tended to increase in late-weaned groups and gradually-weaned groups. No difference was detected in body core temperature by age or pace. During the weaning transition, average daily gain was lower in LA than EA (0.62 vs. 0.11 Kg/d) and gradually-weaned groups had increased ADG (0.65 kg/d). Change in grain intake, but not forage intake, was greater in gradually-weaned groups. Mean rumen pH tended to increase from EG to LG (7.65 vs. 8.84) and from LA to LG (7.89 vs. 8.84). Overall, calf health is affected by both age and pace of weaning, though the health parameters impacted by age and pace differ.

Take home message: From the above data we determined that weaning at 8 weeks improved health of young calves. We also saw that gradual weaning demonstrated benefits to the rumen environment in the form of grain intake and rumen pH. Combining age and pace demonstrated that gradual weaning at an earlier age increases average daily gains and provides more consistent intakes.