Spray Dried, Pasteurised Bovine Colostrum Protects Against Gut Dysfunction and Inflammation in Preterm Pigs

OBJECTIVE: Feeding bovine colostrum (BC) improves gut maturation and function, and protects against necrotizing enterocolitis (NEC), relative to formula in newborn preterm pigs. Before BC can be used for preterm infants, it is important to test if the milk processing, required to reduce bacterial load and increase shelf life, may affect bioactivity and efficacy of a BC product. METHODS: We investigated if spray dried, and pasteurised, spray dried BC had protective effects on gut function in preterm pigs, relative to formula. After a 2-day total parenteral nutrition period, preterm pigs were fed formula for a few hours (to induce a pro-inflammatory state) followed by 2 days of formula (FORM, n = 14), BC (COLOS, n = 14), spray dried BC (POW, n = 8), or pasteurised, spray dried BC (POWPAS, n = 9). RESULTS: Spray drying and pasteurisation of BC decreased the concentration of TGF-β1, TGF-β2 and increased protein aggregation. All three BC groups had reduced NEC severity, small intestinal levels of IL-1β, IL-8 and colonic lactic acid levels, and increased intestinal villus height, hexose absorption, and digestive enzyme activities, relative to the FORM group (all P < 0.05). All three BC diets stimulated epithelial cell migration in a wound-healing model with IEC-6 cells. CONCLUSION: Spray drying and pasteurisation affect BC proteins, but do not reduce the trophic and anti-inflammatory effects on the immature intestine. It remains to be studied if BC products will benefit preterm infants just after birth when human milk is often not available.

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