

**A calf model: Influence of milk processing temperature on growth performance, nitrogen retention, and hindgut's inflammatory status and bacterial populations**

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Short title: **Heat treatment of milk and nutrient value**

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## Summary

This research communication describes a study aimed at evaluating the effects of heat treatment of milk on growth performance, N retention, and hindgut's inflammatory status and bacterial populations using young dairy calves as a model. Twenty-one Holstein calves were randomly allocated to one of three treatments: raw milk (RM), pasteurized milk (PAST), or UHT milk (UHT). Calves were submitted to a N balance study, and a biopsy from the distal colon and a faecal sample were obtained from 5 animals per treatment to determine expression of several genes and potential changes in the hindgut's bacterial population. Milk furosine content was 33-fold greater in UHT than in RM and PAST milks. Calves receiving RM grew more than those fed UHT, and urinary N excretion was greatest in calves fed UHT. Quantification of *Lactobacillus* was lower in calves consuming PAST or UHT, and Gram negative bacteria were greater in UHT than in PAST calves. The expression of IL-8 in the hindgut's mucosa was lowest and that of IL-10 tended to be lowest in RM calves, and expression of claudin-4 tended to be greatest in UHT calves. In conclusion, the nutritional value of UHT-treated milk may be hampered because it compromises growth and increases N excretion in young calves and may have deleterious effects on the gut's bacterial population and inflammation status.