or systemically? These data do not provide an answer.

Amongst the 244 study calves mentioned in the 'refusal-to-suckle' case study described above, there were nine deaths – four following complications of umbilical infections and five with abomasitis and/or rumenitis as part of the necropsy findings. Because of the findings of abomasitis, milk refusals, and slow starts, the owners chose to shift colostrum feeding closer to Nature’s way - suckling and smaller volumes per meal. The owners will monitor their change in management by submitting dead calves to the Animal Health Laboratory at University of Guelph.

**Accelerated Colostrum Feeding to Dairy Calves**

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Abomasal bloat and emphysematous abomasitis may occur rarely, sporadically, or in clusters of dairy calves on a farm. There have been calls for research that would consistently reproduce the disease and for prevention and control strategies. (1) Signs similar to those seen in naturally occurring disease have been induced experimentally using infusions of Clostridium perfringens (2) or a readily fermentable substrate (3). Nonetheless, there has been scant, if any, research in recent years. Practitioners and diagnostic laboratories continue to see cases. This article explores the role of accelerated colostrum feeding as a predisposing cause.

**Accelerated Colostrum Feeding**

The common advice is to feed newborn calves four litres (L) of colostrum as soon as possible after birth to provide 150-200 g of IgG that is needed to diminish the chance of failure of passive transfer (FPT). (4,5) Since average colostrum contains about 50 g of IgG/L, simple math was used to arrive at the four L. As a result, producers are force-feeding four L of colostrum in one meal - a practice based on science, assumptions, mathematical extrapolation, convenience, misinterpretation or expert advice.

The defining characteristic of accelerated colostrum feeding may be a single feeding of four L by esophageal feeder within four hours of birth. Salient features include the volume delivered, speed of ingestion, labour devoted to the task, or quantity of nutrients in the feeding.

**Questioning Four Litres in One Meal**

Accelerated colostrum feeding may have become rooted so deeply in calf management that what may be traumatic to the calf has become normal to us. Certainly, immunoglobulins benefit a calf. But does the volume of colostrum or
method of delivery (6) do harm? Producers who follow the advice complain about calves not suckling at their next meal. This makes calf-feeding frustrating and time consuming for producers and, perhaps, stressful for calves. Some abandon the technique, whereas others carry on while questioning the practice. During the first three days of life and with suckling their dams, daily colostrum intake for Holstein calves may vary from nine to twenty-one percent of their birth weight (7) and they consume their colostrum in several meals. With suckling, each meal is comparatively small, and since abomasal capacity is less than two L, should we force feed more than two L in a meal? Why do advisors recommend gorge-feeding colostrum yet tell producers that over-feeding is a hazard for milkfed calves? It’s difficult to find information about pain, discomfort, reflux or aspiration, or a long intermeal interval following force-feeding with four L of colostrum. Yet, information in post-mortem reports for neonatal calves should make us wary about overfeeding colostrum, especially by esophageal feeder.

Ruminal Acidosis and Anaerobic Conditions
Esophageal feeders facilitate prompt and rapid administration of fluids to calves. Physical damage to the pharynx or esophagus, aspiration into the lungs, ruminal acidosis, or establishment of anaerobic conditions in the fore stomachs may be unwanted side effects. Abnormal fermentation of milk in the fore stomachs produces an accumulation of acid that leads to ruminal and systemic acidosis. Significant volumes of milk entering the fore stomachs may change conditions from aerobic to anaerobic. Whereas suckling stimulates closure of the groove under natural conditions, use of esophageal feeders, feeding large volumes at a calf’s first meal, or bucket feeding can lead to failure of the reflex, failure of groove closure and milk entering the rumen. Distension of the abomasum with large volumes of milk at one time can allow milk to overflow or reflux into the rumen. Similarly, the pressure from overfilling can force the groove to open partially and allow milk to leak into the rumen.

Ruminal acidosis in itself may cause diarrhea. (8,9) In calves fed by nipple-bottle, fluids pass directly into the abomasum. In neonatal calves fed by esophageal feeder, fluids initially enter the reticulum, then the cranial sac and the remainder of the rumen. As the rumen fills, fluids spill into the omasum and the abomasum. A volume of 400 mL may be administered into the esophagus before overflow begins from the rumen. (10)

Dehorning study results
Journal of Dairy Science | Updated: December 13, 2011

A large European study revealed producers’ opinions of the widely implemented dairy management practice of dehorning. The results of 639 questionnaires completed by northeastern Italian dairy producers indicated:

More than 80 percent of farms practiced dehorning.