



Improving

THE TRANSITION PERIOD is a difficult time for many dairy cows. They are uncomfortably pregnant, have to go through the stress of calving, and then need to gear up their entire system for lactation. Throw in some diet and pen changes and it's no wonder that cows struggle through this time. Many of the metabolic problems associated with this time have their roots in the dry cow period, and their effects can reach far into lactation.

Research on the transition period is extensive. Low energy, straw dense diets for dry cows have become an industry standard after much research in this area. Maintaining body condition score, while trying to encourage high feed intake, can help set cows up for an easier transition. High straw diets come with some problems of their own though, as it can be hard to make a nice consistent mix with straw, and cows tend to sort out long fibre particles from a ration. This can actually end up hurting intakes, and has the potential to cause the problems that these diets are hoping to prevent.

The University of Guelph has done some focused research in the last couple of years regarding how to improve these high straw diets to help cows transition better into lactation. The first trial looked at straw chop length and the impacts it had on the transition period. They compared the performance of cows fed a long chopped straw (10.2 cm screen) or a short chopped straw (2.5 cm screen). It probably won't surprise anyone that the cows fed the short chopped straw performed better than those fed the long straw. While both groups

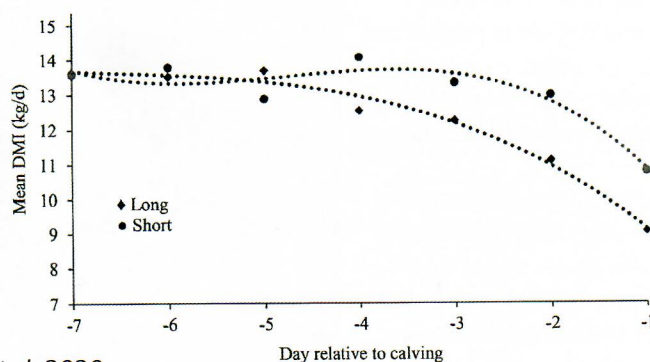
still sorted their respective TMRs, the cows receiving the long straw sorted more than the cows getting the more finely chopped straw. Cows fed the shorter straw had higher intakes, at 15.6 kg of DM/day, compared to the long chopped straw, at 15.0 kg of DM/day. Not only were their intakes higher over the whole period, but the intakes were also more stable before calving (Figure 1). This may have contributed to the more stable rumen pH and lower, more stable BHB levels observed after calving in the cows fed the short chopped straw. BHB levels are used to monitor/test for ketosis in cows, with higher levels indicating a potential metabolic problem.

The same research group also looked at adding a molasses-based liquid feed supplement to a short-

chopped high-straw dry cow diet. Molasses-based liquid feeds (LF) are often used to help rations "stick" together better, as well as provide a source of sugar in the diet. Both of these factors can help increase feed intakes. While the addition of the LF didn't seem to change how the high-straw ration "stuck" together, the group suggested that the sugar aspect is behind the results they saw. Cows do like a sweet feed, and the addition of the LF increased feed intakes by almost 2 kg of DM/day during the dry cow period.

Beyond making the feed more palatable, sugar has many positive nutritional benefits. Sugars provide a rapid source of energy for the rumen microbial population, especially fibre-digesters, which are important

Figure 1: Impact on straw chop length on average daily DMI the week leading up to calving



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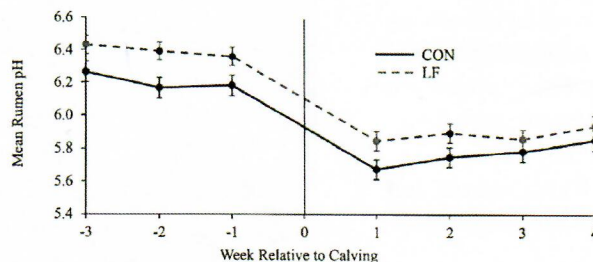


Figure 2: Impact of molasses supplementation (LF) on average rumen pH

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in a high straw ration. Sugars have also been shown to increase butyrate production in the rumen. This volatile fatty acid is known for its rumen health benefits, as it positively affects the lining of the rumen. This positive impact may carry through into early lactation, even if the LF is no longer fed. In this study pH was used to help monitor rumen health. The pH was positively impacted by the addition of the LF to the diet, and benefits of this can be seen to carry over into the beginning of lactation (Figure 2).

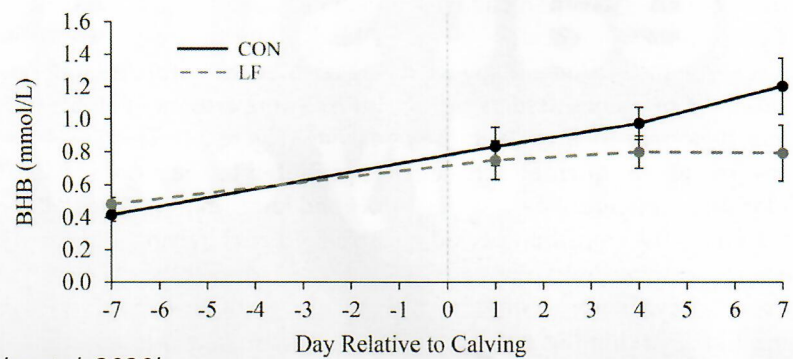
Adding the LF to the dry cow ration may also have the potential to reduce ketosis risk after calving. Cows that didn't receive the LF before calving, had average maximum BHB levels at 1.5 mmol/L, which falls into the sub-clinical ketosis range. Cows fed the LF averaged lower maximum BHB levels at 0.9 mmol/L, reducing their risk for ketosis. The BHB levels also appeared to be more stable after calving than in the cows

that weren't fed the LF (Figure 3).

High straw diets have become the norm on farms that are targeting low energy dry cow programs. Keeping the straw chopped short can help reduce diet sorting and improve feed intake before calving. Adding a molasses based liquid feed supplement can further improve a high straw diet by adding sugar to increase intakes, and help improve rumen and metabolic health after calving. **D**

References: Havekes, C.D., T.F Duffield, A.J. Carpenter, and T.J. Devries. 2020a. Effects of wheat straw chop length in high-straw dry cow diets on intake, health and performance of dairy cows across the transition period. *J. Dairy Sci.* 103: 254-271. Havekes, C.D., T.F Duffield, A.J. Carpenter, and T.J. Devries. 2020b. Effects of molasses-based liquid feed supplementation to a high-straw dry cow diet on feed intake, health and performance of dairy cows across the transition period. *J. Dairy Sci.* 103: 5070-5089.

Figure 3: Impact of molasses supplementation (LF) on blood BHB levels



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