

DRECA DAIRY RESEARCH SUMMARY

Vol. 1 No. 4 2014

“Lower pregnancy losses in lactating dairy cows fed a ration containing flaxseed”

Why is this important?

Fatty acids can help improve energy balance and enhance reproduction

Due to their caloric density, dietary fats may reduce the harmful negative energy balance that commonly occurs at the beginning of lactation, improving reproductive performance. In addition, polyunsaturated long chain fatty acids like alpha-linolenic acid (ALA) seem to have a particularly beneficial effect on reproduction by reducing the synthesis of prostaglandin F₂alpha and improving pregnancy rates.

What did we do?

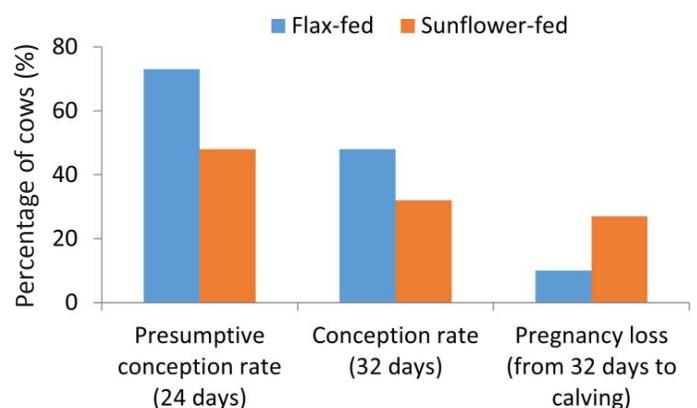
Our study used 121 cows that were fed a total mixed ration containing either rolled flaxseed, which is high in ALA, or rolled sunflower seed, which is low in ALA to provide 750 g fat per day. Cows were on the diets from 28 days before to 32 days after breeding. After being synchronized for ovulation, cows were artificially inseminated. Blood progesterone was measured at 21 and 24 days after insemination to indirectly determine if they had conceived; pregnancy was confirmed by ultrasound 32 days after insemination. Cows that were not pregnant were re-inseminated 10 days later.

What did we find?

A flax-based ration may increase early embryo survival and reduce pregnancy losses

Embryo survival in the flax-fed cows was higher in the first 24 days of pregnancy than in sunflower-fed cows (73 versus 48%). However, embryo survival between 24 and 32 days of gestation was about the same (67%) in both groups, indicating that the conception rate at 32 days in flax-fed cows (48 versus 32%) was due to differences during the early period of development. Pregnancy losses from conception to calving were lower in flax-fed cows than in sunflower-fed cows (10 versus 27%). See Figure 1.

Figure 1. Conception rates and pregnancy loss in cows fed a ration with either flaxseed or sunflower seed



DRECA: Dairy Research and Extension Consortium of Alberta

Alberta Agriculture and Rural Development, Alberta Milk, the University of Alberta, and the University of Calgary

A partnership in dairy research, extension and education activities
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Consequently, the flax-fed cows carried more calves to term than sunflower-fed cows. This may be because flax-fed cows ovulated larger follicles, which may have yielded more viable eggs than from smaller follicles of sunflower-fed cows.

It is important to note that cows were fed their respective rations for only about 4 weeks before and after artificial insemination. Therefore, flax supplementation for extended periods of time is probably not necessary to reap its benefits.

Ration affected milk composition and fatty acid concentration

Overall, milk yield or composition was not affected by the different rations. However, milk fat concentration (3.5 to 3.2%) and yield (1.3 to 1.1 kg/d) declined from week 0 to 4 after calving in cows fed sunflower seed. Both rations decreased medium chain fatty acids and increased long chain fatty acids in milk. In particular, flax-fed cows nearly tripled the amount of ALA in their milk, indicating that a substantial portion of the fatty acids in the flax ration escaped modifications in the rumen.



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Flax in the ration did not decrease feed intake

Although the addition of fats in the ration can reduce dry matter intake, we found that intake was not affected by the inclusion of flaxseed. However, intake was slightly lower in cows fed sunflower seed. This difference did not affect body weight or body condition score, as both were relatively similar between the groups.

What does this mean?

The inclusion of flaxseed as a source of alpha-linolenic acid in the rations of lactating dairy cows from 4 weeks before to 4 weeks after insemination increased early embryonic survival and reduce pregnancy losses.

Summary Points

- Feeding a flax-based ration for 4 weeks pre- and post-breeding can increase conception rates and reduce pregnancy losses in lactating dairy cows.
- Cows consuming a flax-based ration ovulated larger follicles, possibly yielding more eggs resulting in improved embryo survival.
- The economic benefits of this approach must be considered carefully because flaxseed could be expensive and relatively difficult to procure in local markets.