

Livestock health:

Essential oils for ruminants

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Improving the milk production efficiency, milk quality, and overall health of goats and sheep are important goals for small ruminant dairy producers. One of the ways to reach this goal is to add select essential oils to the diet. Essential oils are compounds that give plants and spices their color and scent. Many essential oils, such as those present in cinnamon (cinnamaldehyde), clove (eugenol), garlic, oregano, and other plants, have antibacterial properties that have long been known and are used at high doses for medicinal purposes and food preservation. To date, studies on several essential oils have revealed the potential of these molecules to increase milk production efficiency of dairy cows, and many producers have already started to implement essential oils into their feeding programs. Specifically, cinnamaldehyde and eugenol are currently being used by many dairy producers in Europe and a few in the United States. These feed additives have been established as safe for use, do not leave residues in milk or meat, and the beneficial effects are often comparable with other feed additive products on the market. What about the effect of essential oils on small ruminant dairy production?

Research on feeding essential oils to sheep and goats is only recently being published. Although there is only

a small amount of data, the effects are intriguing. Feeding essential oils to dairy goats and sheep has shown the potential to:

- Improve animal health by killing intestinal parasites and worms
- Increase milk fat and milk protein yield
- Improve udder health and decrease somatic cell count
- Reduce body fat mobilization and prevent ketosis
- Improve efficiency of nitrogen utilization

The effect of essential oils on small ruminant health has been looked at by a research group in Brazil. They found that eugenol (from cloves) was able to prevent the hatching of eggs from some intestinal nematodes. Surprisingly, as little as 0.5 % of eugenol prevented all eggs from hatching. With respect to metabolism, some research was presented at the 2009 American Society of Animal Science-American Dairy Science Association joint annual meeting. Researchers in France looked at the effect of a feed supplement (XTract 6965, which is a microencapsulated mixture of eugenol and cinnamaldehyde) on dairy goat performance. Some of their results are shown in Figure 1. They found a slight increase in milk yield, an increase in fat and protein yield, a decrease in somatic cell count, and a decrease in milk urea. These researches also presented a separate experiment where they fed goats carrying twins Xtract before kidding and they found that it decreased fat mobilization and may prevent ketosis (Figure 2). Feeding a different essential oil product (Xtract 60-7065), which contains eugenol, cinnamaldehyde, and capsicum (from red peppers) to ewes increased dry matter intake and body weight. This product was also fed to lambs and it greatly increased survival rate, while improving rumen health and development. Other research has shown that feeding sheep cinnamaldehyde changes the population of bacteria in the rumen. The implications of this effect, however, are still unclear.

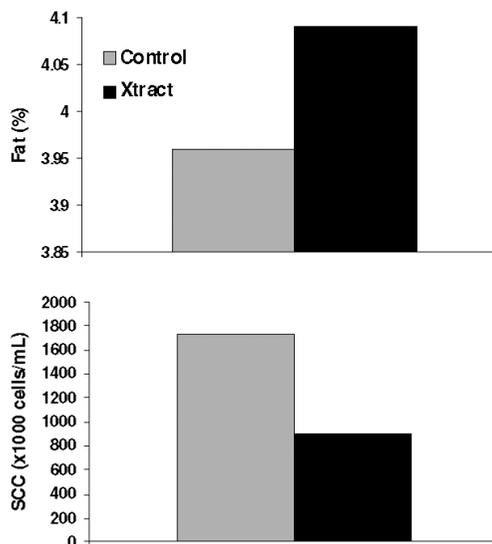


Figure 1: The effect of tract 6965 on milk fat and somatic cell count of dairy goats.

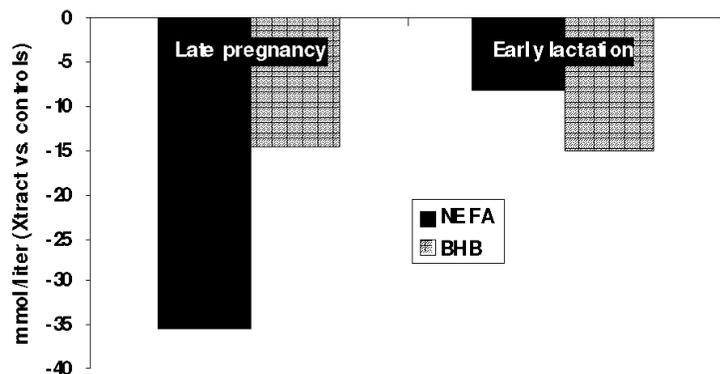


Figure 2: Xtract 6965 decreases beta-hydroxy-butyrate (BHB) and non-sterified fatty acids (NEFA) in the blood of late pregnant goats.