by Emma Wall

A pinch of herbs and spices may pay off

THE use of antibiotics in animal feeds is receiving greater attention because of the potential for antibiotic residues and resistant strains of bacteria. In the European Union, the use of antibiotics in animal feed (including monensin) has been banned since 2006. This really has pushed researchers to try to find a "natural" alternative that can improve production efficiency of food animals, and some herb and spice extracts (essential oils) look like promising candidates.


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Essential oils are compounds that give plants and spices their color and scent. Many essential oils have antifungal, antioxidant, and antibacterial properties that are used to protect their plant of origin. The antibacterial properties of many essential oils present in cloves, garlic, oregano, and other plants have been known for years, and these oils have been used to flavor and preserve foods. The essential oils responsible for the antimicrobial activity can be isolated and produced commercially. Recently, the use of essential oils as feed additives has become an exciting area of study as a means of improving animal productivity.

Laboratory research has shown that certain essential oils, including garlic oil, cinnamaldehyde (from cinnamon), and eugenol (from cloves), improve the efficiency of protein metabolism, decrease the acetate:propionate ratio, and reduce methane gas production (see the July 2010 issue, page 472). This has led from results in a laboratory setting to several on-farm cow experiments and the development of some commercially available feed additives.

There are only about 10 to 12 scientific publications (mostly in the *Journal of Dairy Science*) that report on feeding essential oils to dairy cows. Some researchers saw a gain in milk yield, others saw no effect on milk yield but improved in feed efficiency, and others saw no effect at all.

Some of the companies that produce the commercially available products have conducted field trials of their own, and I will only list a select few of them here.

The company that sells CinnaGar (a blend of cinnamaldehyde and garlic) says on their website that the product can raise milk yield by 3 pounds per day, but that is based on five field trials that have not been published. In a published article, CRINA® Ruminants raised milk yield of older cows by about 2.6 pounds per day and also saw higher dry matter intake, but it had no effect among first-calf heifers. On the other hand, in other published articles, CRINA® Ruminants had no effect on milk yield.

A cinnamaldehyde product made by a company called Phodé has been shown to reduce dry matter intake with no effect on milk yield, so it can improve feed efficiency. All of these results are based on a handful of field trials. Probably the most convincing set of results has been reported by the company that produces Xtract Dairy (6965). They looked across 18 field trials, covering almost 1,000 cows, and they found that Xtract consistently raised milk yield by about 2.4 pounds per day, and it also improved weight gain during lactation.

It's worth asking your nutritionist if he or she has any experience with essential oil commercial products because there certainly is growing evidence that some essential oils can improve efficiency of milk production. Here are some questions that you might consider asking:

- What research has been conducted on the product? Can you show me any published data?
- How repeatable are the responses that have been obtained with the product?
- How is the additive made? Is it encapsulated to reduce volatility and minimize issues with palatability?
- How can this product improve cow performance across each stage of lactation?

There is no question that some essential oils have shown promising effects. But more animal experiments are needed to determine the optimal feeding levels of specific essential oils across different management systems and nutrition programs.

The author obtained a doctoral degree in lactation biology from the University of Vermont's department of animal science. She is currently a postdoctoral associate in the University of Vermont's department of medicine as well as a scientific consultant and free-lance writer.

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