

Keeping Kelp in Front of Cows on Grass

By Brittany Olson, Reprinted with permission from *Progressive Dairyman*, March 18, 2019



In another installment of Penn State Extension's Dairy Grazing Management Guide webinar series, University of New Hampshire professor, extension educator and veterinarian Andre Brito discussed the growing popularity of supplementing kelp to cows in pasture-based systems, both organic and conventional. Brito, who has been on the UNH faculty since 2009, conducts research at the UNH Burley-Demeritt Organic Dairy Research Farm.

Why Kelp?

Kelp is a species of brown seaweed that is rich in minerals, especially iodine. It also contains a plethora of other nutrients such as vitamins, polyunsaturated fatty acids (PUFA), polyphenols and bioactive peptides. Kelp is also loaded with phlorotannin, a compound similar to terrestrial tannins found in legumes that affects carbohydrate and protein utilization in addition to inhibiting the growth of bacteria. Kelp also helps pastured cattle meet their daily nutritional requirements that may not always be met by grass and legumes. While pasture forages are higher in crude protein content, kelp is far richer in calcium, magnesium, potassium and sulfur than straight pasture, on top of being a solid source of iodine.

"Kelp also has high concentrations of antioxidants such as beta-carotene and fucoxanthin, which may improve animal health as well," Brito said.

Brito cited data showing 59 percent of organic dairy farmers in New England fed kelp to their cattle, along with 49 percent of organic dairymen in Wisconsin and 83 percent of Minnesota organic dairymen. According to a 2015 study, organic dairy farmers in the Northeast fed kelp for improvements in body condition score and overall animal appearance. Kelp was also shown to decrease somatic cell count, reproductive issues and cases of pinkeye in addition to fly abatement during summer grazing.

"You can see it's a prevalent feed in the organic sector," Brito said. "I'm not too familiar with using kelp in conventional cows, but I would assume that there are some conventional farms in a pasture-based [system] feeding kelp."

According to Research

Studies conducted at the UNH Burley-Demeritt research farm investigated the effect of kelp meal supplementation on milk yield, digestibility, overall animal health and methane emissions during grazing season from June through October as well as winter months.

"Also, we had liked to improve our understanding of iodine metabolism in dairy cows fed kelp year-round," Brito said.

The subjects of the study were 20 Jersey cows averaging 175 days in milk with daily production at 45 pounds per day with a mean bodyweight of 972 pounds. The study group received 4 ounces of kelp per day, compared to the control group that received no kelp at all, and received fresh pasture twice per day in addition to supplemental TMR twice per day.

Samples of feed, blood, milk, fecal matter and urine were collected monthly throughout the study, while gases were taken using the GreenFeed system, which uses a head chamber with grain to entice the cows, read their RFID tags and measure their methane emissions through gases leaving the body during belching.

From a milk production standpoint, cows eating kelp gave slightly more milk than the control group in July and September, while the control group was more productive in August as pasture biomass began to decrease. However, those differences were not statistically significant. No statistical significance was shown in any difference concerning pasture intake and dry matter intake either.

The study group had lower but not statistically different linear somatic cell counts and higher blood serum cortisol levels than the control group throughout the experiment, as well. No statistically significant differences were shown in methane production, yield or intensity.

In short, kelp supplementation maintained or slightly improved fluid milk and milk solids production during the grazing season, and Brito said kelp's impact on blood cortisol, somatic cell count and methane emissions warrant further investigation. "If we had a larger sample size, we may have seen a statistical difference, but we were only studying 20 cows," Brito said.

On the other hand, cows eating kelp had significantly higher levels of milk iodine concentration compared to the control group. They also showed lower levels of glucosinolates, or sulfur compounds, because the sulfur bonded to iodine and passed into the milk. Both compounds are essential to thyroid function, which regulates hormone processes for growth and development in tandem with metabolism and energy regulation.

"Kelp meal supplementation effectively increases the concentration of iodine in milk. Therefore, there are concerns and opportunities regarding the impact of iodine in human health," Brito said.

Final Thoughts on Feeding Kelp

While kelp meal supplementation may provide organic farmers with an additional opportunity to boost animal health, the lack of a statistical difference in milk production, somatic cell count and feed intake warrants further investigation. Kelp isn't exactly cheap, either, at a cost of anywhere from \$50 to \$65 for a 50-pound bag, and when a herd of cows receives 4 ounces per head per day, one bag of kelp may not last very long. However, the significant improvement in milk iodine levels may have positive implications for human health and again warrants further investigation.

"There is a critical need for developing a comprehensive evaluation of iodine concentration in retail organic milk," Brito said.

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