

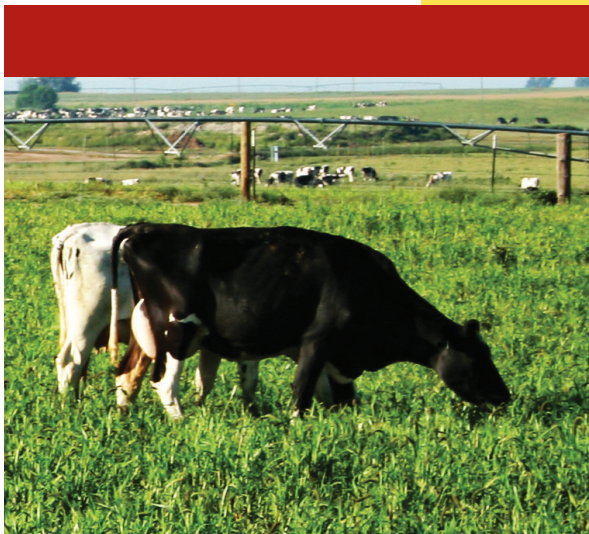
Nutrition

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P + L + U + S

PASTURE-BASED DAIRYING IS A VIABLE OPTION

Record high grain, fuel and fertilizer prices have strained the economic viability of U.S. dairy operations in recent years, sometimes to the breaking point. University of Wisconsin professor of animal science David Combs, PhD, says there is a viable alternative to high-input, confinement style dairying that allows producers to profitably make milk—pasture-based dairying.



“It is in some ways a case of returning to our roots, or coming full circle with the way things used to be done,” says Combs. “But today’s successful, pasture-based dairies also apply the advanced knowledge that the industry has acquired in recent decades. It’s an interesting hybrid of the oldest of the old and the newest of the new.”

Oregon-based nutrition consultant Woody Lane, PhD, concurs that grazing is a highly specialized skill, and has evolved tremendously in recent years. As an example, he cites the old educational bulletins that advised turning cows out when pasture height is a certain level and rotating them off at a specified lower level. “We now know that’s completely wrong,” he states. “Cows don’t produce off of inches; they produce off of pounds of dry matter.”

Combs says quality pastures can achieve four to six tons of dry matter per acre and can be grazed six to nine times per season. Care should be taken to avoid overgrazing, which is done by allowing or forcing cows to leave less than 35 to 40 percent dry-matter residue in the pasture. The result is lower dry-matter intake and lower milk yield per cow per acre.

Milk production in general is a subject of debate when considering pasture-based systems. “Too often, I think the dairy industry strives for production at any cost,” says Lane. “My answer is, ‘who cares if production is lower?’ Capital investment and overhead also are much lower, and it is net profits about which we should be most concerned.”

Supplemental grain and minerals are necessary to keep grazing cows healthy and productive, and Combs advises that cows on pasture are capable of matching the milk production level and components of confinement cows, largely as a result of proper supplementation. His guideline is one pound of grain supplement to 3.5 to 4.0 pounds of milk produced per day. Most pasture-based dairies deliver their mineral supplements as a part of the grain mix, and balancing diets for undegradable protein also is important.

Even at that level of grain supplementation, pasture-managed cows are more efficient at converting feed to milk. Research on high-producing dairy cattle shows that cows under grazing conditions consume less grain and forage, which leads to lower rates of forage and liquid passage, lower total digesta weight

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PASTURChlor™ PROMOTES PASTURE-BASED HEALTH

West Central recently adapted the DCAD-lowering properties of SoyChlor® to improve the health of dairy cows managed in pasture-based systems.

PASTURChlor™ is a new chloride and magnesium supplement from West Central specifically developed to stimulate bone calcium utilization in pre-fresh cows managed on pasture. Because many forages utilized in pasture systems are high in potassium—a cation—cows grazing pasture

before calving can benefit from an anionic boost to reduce DCAD. Feeding PASTURChlor provides this boost by supplying chloride ion. Additionally, it provides essential supplemental magnesium in a highly soluble form, and does not contain supplemental calcium.

To learn more about PASTURChlor, visit <http://www.west-central.com/dairy-nutrition-soy-processing/PASTURChlor/about/>.





BY WOODY LANE, PHD
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THE UNIQUE CHARACTERISTICS OF PASTURE-BASED DAIRYING

I have worked with livestock grazing systems for more than 30 years, and among them have been many successful dairies. I'm happy to share a few of the most important lessons that my clients and I have learned along the way.

1 Pasture-based dairying is a viable management option. Choosing to raise dairy cattle on pasture is a mainstream business decision, and not a cult or a religion. While milk production in grazing herds often is lower than that of conventional dairies, the risks are lower and net income often is higher. It also is important to point out that "pasture-based" does not necessarily mean "organic."

2 When you become a pasture-based dairy farmer, you become a grass farmer. Pasture-based dairying does not mean you simply turn the cows out. It is a unique and management-intensive system that requires every bit as much proficiency as confinement dairying, but a different set of knowledge. Pasture is a crop, and you use animals to harvest it. Sustaining forage crops is a difficult and highly specialized task.

3 Forages are not purchased feed. Feeding cows on pasture is different than purchasing a semi-load of a commodity and balancing a TMR for it once. Quality and consistency vary considerably with forages, and must be monitored constantly. Nutrition consultants can provide useful advice as dairies need to adjust for ever-evolving pasture conditions.

4 Many challenges in confinement dairying are eliminated with grazing. The benefits of raising cows on pasture include healthier feet and legs;

lower incidence of respiratory disease; and fewer cases of diseases such as mastitis, metritis, milk-fat depression and ketosis. Cow longevity also is increased—it is common for grazing herds to have 10-year-old cows. Pasture crops require a fraction of herbicides and pesticides compared to crops typically used in TMRs, and often are perennial, reducing the fuel and overhead required for annual replanting of crops like corn. Because the animals do most of the harvesting, the equipment investment and fuel use are greatly reduced. Labor and equipment required for manure removal are less, and natural fertilization is another benefit.

5 Grazing presents new challenges not incurred in confinement systems. Parasite control and fly populations are of greater concern in pasture-based dairying. Grass tetany and endophyte toxicity are health threats, and milk fever can be a problem when cows consume high-potassium forages. Problems with bloat can occur on legume pastures. The additional energy needed to promote reproductive efficiency in early lactation is more challenging to deliver in pasture-based systems. Predators also can be a serious issue, especially for heifers being raised on pasture.

If high feed prices persist, as most forecasts suggests, more dairy producers may turn to pasture-based systems as a profitable and sustainable alternative to confinement dairying, and they will need sound, professional advice to do so successfully. This creates an excellent opportunity for nutrition consultants to provide specialized services and advice and set themselves apart in the profession.

FROM THE **Maternity Pen**

HEALTHY TRANSITIONS REQUIRE ATTENTION

High-producing dairy cows have been described as "metabolic athletes," performing remarkable metabolic transitions and increases in nutrient utilization during early lactation.

However, 30 to 50 percent of dairy cows also are affected by some form of metabolic or infectious disease around the time of calving, and uterine health problems affect up to half of all cows in the first 60 days postpartum.

University of Guelph researcher Stephen LeBlanc has studied the fresh-cow disease complex and its effects on subsequent reproductive performance, and says, "Essentially all dairy cattle experience a period of insulin

resistance, reduced feed intake, negative energy balance, hypocalcemia, reduced immune function and bacterial contamination of the uterus soon before, or in the weeks after calving."

LeBlanc has explored methods of predicting and mitigating these challenges, concluding that the timing, magnitude and duration of peripartum increases in circulating concentrations of non-esterified fatty acids (NEFA) and serum β -hydroxybutyrate (BHB) are associated with the risk of abomasal displacement, uterine disease and impaired reproductive performance from one to 20 weeks later.

The researcher suggests that a suc-

cessful transition-cow management strategy could include measuring NEFA concentrations in the week before expected calving and BHB concentration in the first week after calving, and employing the following proactive measures:

- Administering propylene glycol to cows with elevated NEFA or BHB;
- Providing cows unrestricted access to nutrient-correct diets and water in the transition period; and
- Minimizing nutritional, housing, social and environmental factors that could impair feed and resting access for peripartum cows.

At the 2012 American Dairy Science Association (ADSA) Annual Meeting held in Phoenix, Arizona, Dr. Jesse Goff presented a research paper he co-authored with Dr. Ron Horst, titled "Comparison of Low Versus High Calcium "Anionic" Diets for Prevention of Hypocalcaemia and Milk Fever," demonstrating

an effective alternate DCAD management program. Also, several other research papers presented during the 2012 ADSA Annual Meeting showed support of the DCAD practices that SoyChlor and West Central's newest product, PASTURChlor, compliment. More on that next issue.

Beyond **B Y P A S S**

MYCOTOXINS CAUSE DISEASE, IMPAIR PERFORMANCE

Molds in feedstuffs produce poisons called mycotoxins that affect animals when they consume contaminated feeds. While molds always are present in the environment and consequently in feed, growing conditions in some years can elevate the level of concern caused by these toxins.

North Carolina State University researcher Lon Whitlow says mycotoxins can impair cow health through a variety of means, including:

1. Reduced feed intake or feed refusal;
2. Reduced nutrient absorption and impaired metabolism;
3. Altered endocrine and exocrine systems;
4. Suppressed immune function; and
5. Altered microbial growth.

While there are hundreds of different mycotoxins, most are produced by three molds: *Aspergillus*, *Fusarium* and *Penicillium*. In dairy production *Aspergillus fumigatus* has been associated with mycotic pneumonia, mastitis and abortions. It also is implicated as a cause of mycotic hemorrhagic bowel syndrome (HBS). Aflatoxin, a mycotoxin also produced from the *Aspergillus* family of molds, is another serious threat because it is carcinogenic and can be excreted in milk from cows that consume it. *Fusarium*-produced mycotoxins are most likely associated with ear or stalk rot in corn or scab in small grains. *Penicillium* produced mycotoxins are most likely in poorly stored silages. "Healthy cows with an active immune system are more resistant to mycotic infections," says Whitlow. "But dairy cows in early lactation are immune-suppressed and more likely to suffer from mycotic diseases and the effects of mycotoxins."

Grain, hay and silage all are susceptible to mold growth and mycotoxin production. Drought and insect damage greatly increase the likelihood of molding and mycotoxin formation in the field. Thus, mycotoxin risks are higher in crop years in which sub-par growing conditions have occurred. Whitlow advises that hybrid selection, along with careful hay- and silage-harvesting and storage techniques, can reduce mycotoxin levels in feed. Feeding techniques that limit spoilage also are recommended; and dry cows, springing heifers and calves should receive the cleanest possible feed.

Counteracting the impact of known high levels of mycotoxins in feed is challenging, but Whitlow says their impact can be lessened by increasing specific nutrients in the diet (especially protein and antioxidant nutrients); using mold inhibitors; and/or feeding absorbent materials such as clays (bentonites and others) or complex indigestible carbohydrates to help bind mycotoxins and reduce intestinal absorption. Yeast cell wall products also can stimulate animal immunity.

Read more about specific mycotoxins and preventive measures at <http://www.das.psu.edu/research-extension/dairy/nutrition/pdf/whitlow-managing-mycotoxins-2010.pdf>.

Quality **C O R N E R**

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Tips for using anionic diets and the "low-calcium" approach to managing milk fever:

1 Just as with the high-calcium approach, reducing the potassium content of the diet helps greatly. For the close-up cows, try to select stored forages or grazing paddocks that have not been fertilized heavily with manure or potash.

2 Avoid calcium supplementation—in the grain mix and in any mineral supplements. Also try to avoid forages or grazing paddocks with significant amounts of legumes. Legumes generally are higher than grasses in their content of calcium.

3 Supplement cows with a soluble form of magnesium. Dietary magnesium levels of 0.4 to 0.5% (of total diet dry matter) not only help with mobilization of bone calcium, but the extra magnesium may also help reduce some potassium absorption from the diet.

4 Supplement the cow's diet with chloride ion to the point that Dietary Cation-Anion Difference (DCAD) is reduced into the 0 to -5 meq/100 gram range. This DCAD range is a bit higher than is often recommended for the more intense "full DCAD" approach, but should be low enough to accomplish a moderate acidification of body fluids.

5 Although there is little research available with reduced DCAD and low-calcium diets over long periods of time, it may be a good idea to avoid this approach if you have a one group dry cow program. While the ability to mobilize calcium from bone is a natural wonder of the metabolism of the cow, doing so for extended periods of time may deplete this source when the diet is also low in calcium.



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- Transition health and reproduction.
- Managing mycotoxins.

Nutrition

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PASTURE-BASED DAIRYING *continued from page one*

and lower rumen volume. Cows on pasture also have higher rumen pH ammonia concentrations and lower total VFA concentrations.

Just as in confinement operations, high dry-matter intake is critical to cow health and productivity. Lower-than-expected forage intake not only lowers production, but can contribute to changes in rumen pH and sub-acute rumen acidosis. Combs says there is a bit of a learning curve when cows are converted from confinement housing to grazing. "We have done research that shows cows literally have to learn how to graze. It is instinctual, and yet it takes them a week or more to make the full conversion to satisfying their appetites from pasture." He cautions that heat stress is an often-overlooked impediment to optimal grazing. In hot conditions, cows will seek shade and comfort over eating. Early morning and evening grazing, with supplements fed at a shaded feed bunk midday, are advised in hot weather.

Unfortunately, it is difficult for curious producers to "dabble" in grazing, because it requires such a whole-scale shift in management styles compared to confinement systems. But one way dairies can "ease in" to grazing is to start by raising heifers in a pasture-based system, then converting the milking herd if it becomes the management system they prefer.

Lane says grazing sometimes gets a bad rap when it is adopted as an option of last resort for dairies in financial trouble. "Often those problems have evolved because of management deficiencies," he explains. "When that same level of management is applied to the new grazing system, the endeavor often fails, and grazing is unfairly labeled as the culprit.

"Grazing is a professional skill. When done well, it can produce outstanding results for the animals, the producer, and the environmental sustainability of the operation."