

Dairy's BOTTOM LINE

Sharing ideas, solutions, resources and experiences that help dairy producers succeed.



Dr. Nigel Cook continues his cow comfort series. Page 2



Marketing plays a key role in today's business. Page 6



There's a right way and a wrong way regarding human-animal interaction. Page 7

Nutrient Management Helps Crops, Protects Environment

Two words—"nutrient management"—have become increasingly popular in agricultural circles. But just what is nutrient management? And who is required to abide by Wisconsin's nutrient management rules?

Amber Radatz, southwestern Wisconsin nutrient management specialist for UW-Discovery Farms, has some answers. She says the term means "managing the sources of nutrients on your farm and combining them with commercial fertilizers to meet the needs and yield goals of the current crop."

As for nutrient management rules, Radatz explains, "We often hear nutrient management referred to as a '590 plan.' This comes from the Natural Resources Conservation Service (NRCS) 590 Standard, which addresses nutrient management. As stated in the standard, 'this practice applies to all fields in Wisconsin where plant nutrient sources and soil amendments are applied during the course of a rotation.'"

This rule applies to all farmers in Wisconsin, "whether you have 1,500 cows or four horses," points out Radatz.



"And for good reason," she explains. "It's important to understand what the nutrient needs of the crop are—whether it's pasture grass, soybeans or corn—and how much of each essential nutrient (nitrogen, phosphorus, and potassium) you're putting onto a field or pasture through manure or commercial fertilizers."

Even though the rule applies to all farmers in Wisconsin, most people have not been penalized to date for not having nutrient management plans. Radatz adds, however, that there are five situations in which the nutrient management plan requirement is more strictly enforced:

1.) A farmer has been offered federal or state cost-sharing for nutrient management (\$28 per acre for plan development) or some other reason, like manure storage installation.

2.) A farmer is participating in the Farmland Preservation/

Working Lands Program.

3.) A farm is regulated under a county ordinance for manure storage or livestock siting.

4.) A farm is operating under the auspices of a Department of Natural Resources (DNR) Wisconsin Pollution Discharge Elimination System (WPDES) permit because it has more than 1,000 animal units.

5.) A farm has been given notice of a pollution discharge.

Radatz stresses that all farms can benefit from having—and using—nutrient management plans. Her first point is that a "well-written" plan can save money if soils are tested and manure and legume credits for nitrogen and potassium are applied.

For example, Radatz points out that the nitrogen supplied by 100 acres of alfalfa is worth

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**Expert advice on increasing alfalfa yield, profit
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The Dairy Cow's Time Budget and Cow Comfort – Part 2

Life in a free stall environment presents the cow with many challenges, and understanding the stresses on the dairy cow's time budget helps us understand the impact of poor cow comfort.

Part 1 of this three-part series discussed fixed and non-negotiable components of the cow's day and addressed her minimum daily rest period. This article, and Part 3, discuss the impact of various challenges on dairy cow health and productivity.

PROLONGED TIME SPENT MILKING

The time available for milking is 2.8 hours per day. Thus, from a facility design perspective, herds that wish to milk three times a day must limit time out of the pen to 56 minutes each milking.

If cows walk at around 3 feet per second at best, factoring in other delays, total travel time to and from the milking center would be a minimum of 5 minutes or so, leaving around 50 minutes for milking.

The most efficient parlors currently achieve a rate of milking that approaches 4.5 turns per hour—one turn being the time taken to fill and empty a row of milking stalls.

The longer the row of stalls, the greater the throughput in terms of cows milked per hour. Each turn takes 13.3 minutes to milk at 4.5 per hour, so the actual number of turns milked in 50 minutes would be 3.8. The maximum group sizes, therefore, range from around 60 cows up to 228 cows across the range of parlor sizes typically constructed in North America.

Unfortunately, pens are sized based on turn time alone, and they are often overstocked. It is therefore not uncommon to find

time out of the pen exceeding 5 hours per day in many dairy herds. In this scenario, the dairy cow simply has no other option but to reduce resting time.

It is perhaps not surprising then that time out of the pen milking was a significant factor for increased lameness prevalence in a recent survey of freestall herds.

Time out of the pen milking is also a function of distance traveled from the pen to the parlor and back again.

Many dairies have a situation where many cows must walk 800 feet per milking or 0.45 miles a day to and from the milking center. It is not surprising, therefore, to see the emergence of thin soles and associated lameness as a result of this increased requirement for traffic on hard-wearing surfaces. Since lame cows do not travel as quickly as non-lame cows, transit time increases, which leads to increased time out of the pen.

While wear rates can be reduced with rubber-walking surfaces—which may help alleviate some lameness problems, excessive walking is a stress in itself, affecting production and udder health.

OVERSTOCKING, COMPETITION FOR STALLS

Studies suggest that overstocking decreases lying time. For lying times to drop below the target of 12 hours per day, however, most studies find that stocking rates in excess of around 1.2 cows per stall are

required, and much greater overstocking is required to see impact on milk yield and health indicators such as lameness.

One researcher found that bunk space in the breeding pen has a significant negative impact when it is below 14 inches per cow. More recently, it has been learned that stocking density of breeding or high group pens has a significant negative influence on overall herd average conception rate.

There is also the issue of what constitutes a "usable stall" just because a stall is built and provided for a cow does not mean that all stalls are treated equally and used identical to one another. The "effective stall stocking density" may be quite different in a situation with large mature Holstein cows occupying small 45-inch-wide stalls



Dr. Nigel Cook

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The Capacity Factor in Farm Business Management

One of the most challenging, and yet most rewarding, areas of farm financial management is the analysis of profitability and financial performance, also known as "capacity." This is where the rubber meets the road, so to speak, in relation to converting resources such as time, labor, capital and management decisions into a return on investment.

In a nutshell, capacity is probably the most important area of financial management.

Previous articles introduced the concept of the "Five C's of Credit" – Character, Capital, Capacity, Collateral and Conditions – and reviewed the Character and Capital factors. In this article we will explore the third "C": Capacity.

While lenders typically analyze numerous ratios and indicators related to capacity based on the nature of the farming operation and the credit request at hand, we'll focus on capacity decisions as they relate to farm business management.

Hobby or Business: A capacity analysis should be prefaced by an understanding of the motive or purpose of the individual farm business. If the farm is operating as a full-time business with the purpose of sustaining itself and the owners' non-farm needs such as family living, insurance, income taxes and other obligations, then capacity analysis is essential to future success.

On the other hand, if the farm's purpose is to supplement other enterprises or to serve as a hobby for the owner, then capacity analysis is less essential but still requires a periodic review – most people do not

want to unknowingly pour capital into a potentially "sinking ship."

Recordkeeping System: A good recordkeeping system is the first step in determining a farm business' capacity to generate profit. However, capacity analysis goes well beyond recordkeeping designed solely for income tax preparation at the end of a fiscal year. It includes numerical comparisons with the capital resource mix and the operational, marketing and risk-mitigation decisions involved.

This is why a trusted financial advisor such as an agricultural lender, accountant or other farm financial expert can be a tremendous resource in this area.

Resource Allocation and Industry Benchmarks: An understanding of the farm business' purpose and specialization or diversification strategies is very helpful because this enables the financial manager to accurately calculate, rate and compare the farm unit's capacity or financial performance with that of similar operations.

While no one farm business is exactly the same as another, there are similarities within many enterprise types. This can expedite the analysis and understanding of how a return on investment can be maximized given an optimal blend of resources.

Profit Margin per Income Unit: An "income unit" is a term lenders occasionally use to describe the capital resource or enterprise type involved in a farming operation. An income unit might be a dairy cow, an acre of corn, a feeder calf or an apple tree.

The next step is to understand how much profit each income unit is able to generate, such as profit per cow, profit per acre and so on. This requires a historical financial analysis of the farm

business involved or, at the very least, an understanding of that particular industry's typical profit margins.

Last, we multiply the number of income units and the profit margin per income unit to determine how much profitability can be expected. In addition, there are debt threshold guidelines per income unit for many enterprise types to be considered. Income unit concepts can be very helpful with business start-up decisions or expansion decisions.

Beyond Net Farm Income From Operations: A capacity analysis goes beyond just farm income and expenses; it also addresses how much profitability may be needed for a fair return to labor and management, income tax obligations, capital asset replacement or expansion needs, present and future debt

repayment, and cash reserves to build liquidity, to maneuver through volatility and to offer flexibility in future plans for the business.

Summary: There are plenty of reasons for a financial manager to be concerned with profitability and overall financial capacity. Ample financial capacity can provide a farm business with many options for future sustainability, growth, diversification, specialization and retirement or transfer to the next generation.

A capacity analysis helps one better understand the current financial condition of the farm business and aids in the development of a roadmap for future success.

By Amber Bennett, Senior Vice President – Credit Delivery, Badgerland Financial



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Focus on Energy Tips for Summer Energy Savings

With summer and rising temperatures, it is important for dairy producers to remember a few simple ways to maintain fan efficiency and save energy.

Rich Hackner, sector lead of the Focus on Energy Agribusiness program, says almost every operation, regardless of size, has the opportunity to save energy with a few simple changes.

FAN MAINTENANCE

According to Focus on Energy, "any dirt that accumulates on louvers, guards/grills, shrouds or blades will reduce air moved by the fan. If louvers do not open freely or if dust builds up on safety screens/grills, fan air flow can be reduced by 30 to 40 percent."

Cleaning louvers regularly and

lubricating them with a dry lubricant, such as graphite, will help prevent dust and dirt accumulation. Dirt from the fan motors should be removed, as dirt can cause motors to run hot, resulting in higher energy use and reducing overall fan life.

Focus on Energy also points out that "loose belts can cause slippage, reduce air flow by up to 30 percent and shorten belt life." As such, it is recommended that belts be checked and re-tensioned monthly if the fan does not come equipped with an automatic tensioning device.

Hackner emphasizes that proper fan maintenance, coupled with actual fan selection, provides a great energy savings opportunity for producers.

Criteria to consider when selecting a fan for the facility include:

- **Motor efficiency.** Less efficient motors affect energy use and noise levels. The same applies to efficient motors that are not properly maintained can have the same result.

- **Blade design.** Some fan blades, such as straight or machete and teardrop designs, have been shown to be more efficient and accumulate less dust than others.

- **Fan clearance.** Focus on Energy notes that "the clearance between the fan blade and the housing will affect efficiency and the static pressure at which the fan is capable of operating. Large clearances will allow air to leak back past the fan blade and housing."

- **Diameter of the fan.** Typically, the greater the diameter of the fan, the more efficient it will be.

Depending on the size of the facilities, Hackner cites that high-volume, low-speed fans (HVLS) may be the best choice.

"They are like an industrial-sized ceiling fan," Hackner says. "They're big, slow-moving, move large amounts of air and are very energy efficient. A single HVLS fan can replace up to six or seven 'normal' size fans."

Focus on Energy agrees: "A 24-foot HVLS fan will move as much air as six high-speed fans and consume only 1/6 of the energy...Current owners have described other advantages, including drier floors, less flies, fewer birds in the barn and reduced noise."

No matter which fan is selected, Hackner stresses that proper maintenance is key to continued energy efficiency and cost savings: "They do wear out. They do need attention. You lose energy and reduce their cooling effectiveness if you don't maintain them properly."

FACILITY ENERGY EFFICIENCY

For overall facility energy efficiency, Focus on Energy provides six steps for improvement:

Step 1: Discover the areas where energy can be saved. On a dairy farm, these areas can include heat recovery, milk parlor equipment improvements, water heaters, fans, lighting, etc.

Step 2: Visit the Focus on Energy website (www.focusonenergy.com). Here producers can find a variety of useful information and tools related to energy savings. The Agricultural and Rural Business Information Library (found under the Information Center tab) has an assortment of press releases, fact sheets, case studies and technical information available.

Producers can also participate in the Farm Assessment Toolkit, a 10- to 15-minute online survey that identifies potential maintenance issues, areas for energy improvement and tips for energy savings, rebates and rewards.

"We worked with the University of Wisconsin to develop this for the USDA," Hackner states. "We work to improve safety and efficiency while providing other benefits such as increased production through long-day lighting."

Hackner points out that the Farm Assessment Toolkit offers producers a general idea of areas for improvement, acting as "a type of litmus test." He notes that the toolkit provides a starting point as to what improvements can be made and where savings can be found.

Hackner clarifies, however, that this valuable online tool should not be used in place of

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Is Marketing Too Complex?

The markets recently reminded us that we operate within a global financial system. We witnessed how financial mismanagement by the government in Greece upset stock markets and disrupted agricultural commodity prices. Unfortunately, what happens in Greece doesn't stay in Greece.

Yes, these world financial happenings can and do impact us. Many dairy producers, when faced with the fires of demanding day-to-day dairy management, are conditioned to focus on what they can control and not on what they can't. Commodity markets and marketing tools are among the perceived "uncontrollable," or at least "too complex" to get involved.

Is marketing too complex?

Some producers we talk to tell us that complexity is the reason they do not engage in marketing. Generally speaking, they say they're not knowledgeable about the nuts and bolts of marketing and do not wish to get involved in something that they don't understand.

Allow me to challenge that logic. Are you an expert at understanding the biochemistry of how a cow turns feed into milk? Most producers are walking textbooks when it comes to milk production. They understand forages and what's best for their herds. They know that nutrition requirements change throughout the lactation cycle. Few understand this process to the biochemical level, when a cow actually turns

feed into milk. Yet, this limited biochemistry knowledge has probably never stopped anyone from becoming a dairy producer.

As marketers, we know the market is and will continue to be volatile, and that a balanced and calculated approach will help to tame down volatility. We know that the market presents different challenges at different times, and that there are tools available for managing volatility. As a dairy producer, you do not need to know everything about the milk markets and hedging tools in order to be successful. You simply need to have a broad understanding of what the tools can do for you, and when to ask for assistance in applying them.

Sam Miller heads up agricultural banking at M & I Bank and has been a banker for 26 years. He says marketing is just as important today as it has been on a historical basis, however, volatility and the reduced ability to absorb extreme financial shock have added more urgency to the need. He and his team look at a number of factors in regards to the financial condition of borrowers. One is the ability to manage the opportunities and risks of revenue and expenses because there is volatility in both the price of milk and cost of feed.

"Producers who do not engage in marketing will need strong balance sheets to be able to withstand some of the volatility that's yet to occur, and to attract and retain credit," Miller says.

Greg Steele, who specializes in commercial dairy lending for AgStar Financial, says that fear of making a mistake is a significant reason many dairy



**Mark Ludtke
Stewart-Peterson**

producers are reluctant to start marketing.

"Market complexity, the inability to tie everything together and understand how global financial problems impact their business... these things influence what producers think about marketing. A good start may be to focus on protecting the price or margin that is available today with strategies that would allow for opportunities to increase revenue down the road," he says.

So how do you get started? First, strip away the noise that clouds understanding and leads to inaction—noise like global financial crises, volatile milk prices, news on whether China will buy more corn and at what point it might affect the price of inputs. The key factor that determines marketing success or failure is your approach, not how much you know about global markets.

Good marketing is more about the structured, strategic decisions you make and execute and less about what you know. Think about it in terms of the health program you create for

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Proper Animal Handling Relieves Cattle, Human Stress

Recent research has shown that cattle thrive when they interact with humans. In addition, proper handling can help maintain production. A win-win situation.

Studies at more than 30 Australian dairies by Paul Hemsworth for the Melbourne School of Land and Environment showed that 20 percent of the variation in milk production at the dairies was due to cow handling. Hemsworth pinpoints actions that cause fear of humans as the most damaging to milk production, as the fear causes the cow to focus on the stressful situation.

To minimize this destructive human fear, Dr. Paul Rapnicki of the University of Minnesota's College of Veterinary Medicine has studied human-to-animal interactions.

"The implementation of low-

stress cow handling techniques will improve the outcomes for both the people and the cattle," he says.

Dr. Rapnicki's research began by exploring the recommendations of well-known beef educator Bud Williams, a Kansas beef producer who recognized a need for better animal interaction. After seeing the success of Williams endeavors, Dr. Rapnicki attended one of Williams' beef handling conferences in Kansas. The two-day event offered the essential tools to properly handle cattle in the least stressful ways.

"Bud challenged us to look at the daily interactions between dairy cattle and people working with cattle differently," Dr. Rapnicki says.

Dr. Rapnicki took on the challenge and began working closely with a transition dairy

operation in Emerald. Emerald Dairy II, managed by Jim Lewis, is a transition operation where animal handling is paramount. Dairy cattle housed at this facility include both mature cows and springing heifers from about six weeks prior to freshening to about two weeks after calving. Each year, 2,700 calvings occur at the operation and calves are housed on the same site until four months of age.

"The transition period is a critical time period for the dairy cow," Dr. Rapnicki states. "This is also a time period for many critical interactions between the people and the cattle.

"Emerald Dairy II provided us with a number of opportunities to learn about, improve upon and apply our stockmanship skills in a large, modern dairy operation."

Though Lewis and Dr. Rapnicki

focused on the crucial care of transition cattle, both agree that proper stockmanship skills are vital for all dairy cattle as it ensures effective two-way communication between a cow and a person.

"The cow will always be consistent in her responses," Dr. Rapnicki says. "The person is the one that can misinterpret."

Utilizing the expected responses from cattle, Dr. Rapnicki explains, can help the producer make informed handling decisions and has worked well for Emerald Dairy II.

The most important behavior to recognize, Dr. Rapnicki says, is the basic animal instinct of cattle. By playing into the natural actions and cattle abilities, livestock can be moved more easily.

See Handling on page 8

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Handling

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Instinctive actions result from the senses of cattle. Cattle and humans are different, with livestock seeing things much differently than humans.

Studies have shown that cattle have panoramic vision of 330 degrees and have a blind spot directly in the back of their heads. They also have poor depth perception and cannot focus quickly on close objects. Cows usually lower their heads to look at something because their vertical vision is only about 60 degrees—less than half of the capabilities of humans. For these reasons, they will also walk slowly in unfamiliar environments.

Comparatively, cows can hear well and don't like high, screeching sounds.

"Hitting or yelling can create a lot of fear and stress," Dr. Rapnicki states. "Cows feel safer in a crowd, so they can be

nervous when alone."

When in groups, the cattle are easier to direct, but still have predictable actions.

"Cattle want to move in the direction they are headed. They want to follow other animals. They want to see what is pressuring them, and they want to return in the direction they came from," Dr. Rapnicki continues.

Being aware of these instinctive behaviors allows the handler to create, change and stop movement in cattle. For example, walking with cattle will tend to slow them down or stop them, while walking against cattle tends to speed up their movement.

"Cattle have very little patience if we attempt to communicate with them improperly," Dr. Rapnicki explains. "If we are not effective in our communication, they easily become confused by our actions.

"Skilled stockmanship actions



Photo by Shannon Hayes

There's a right way and a wrong way regarding human and animal interaction.

are able take advantage of the basic, natural movement tendencies of cattle."

Natural cattle movements are partially attributed to cattle being a prey species. Because they are instinctively watching for predators, cows perceive their surroundings with a natural

trepidation. Therefore, Dr. Rapnicki says cows need to be able to predict what the stockman is doing in advance, which can be best achieved by moving in straight, distinct lines.

"Always walking and working

See Handling on Page 12

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Comfort

Continued from page 2

in contrast to a situation with larger more appropriately sized stalls. For that reason, stalls should be sized appropriately to the size of the cows occupying them.

POOR STALL DESIGN

While stalls should be designed to meet the requirement of each cow to obtain at least 12 hours per day of rest, some designs fail to provide for the movements of lying and rising, adequate resting space or a cushioned surface—and thus tend to reduce lying behavior to less than 10 hours per day.

In one study, free stalls with a concrete surface and a restrictive divider design resulted in reduced lying time, increased periods spent perching—standing half in and half out of the stall—and an increased rate of clinical lameness in heifers two months after calving compared with heifers kept in a stall with greater surface cushion and a less restrictive divider design.

The main factor determining whether a cow spends time standing or lying down in the stall is lameness, and surface cushion and traction is the key determinant of the success of a stall surface.

When cows with sore feet have to rise or lie down on a firm unyielding surface, such as a mat or a poorly cushioned mattress, the pain associated with the process leads to increased time spent standing in the stall between lying bouts, fewer lying sessions per day and a decrease in lying time. Thus, poor stall designs lead to lower lying times and increased risk for lameness, and cows, once they become lame, behave different to non-lame cows in the same stall design, leading to even lower resting times!

Sand, because of its ability to supply traction and support to the weight bearing limb during rising and lying movements, is an optimal surface for both non-lame and lame cows alike and results in short stall standing times, typically less than two hours per day. It remains to be seen whether other deep, loose bedding materials such as chopped straw, sawdust or composted manure solids behave in the same way. As such, it seems logical to expect that these materials would be more similar to deep sand than to a firm mat or mattress. However, until proof is obtained, sand remains the gold standard for stall base, with less risk for udder health issues than the other materials.

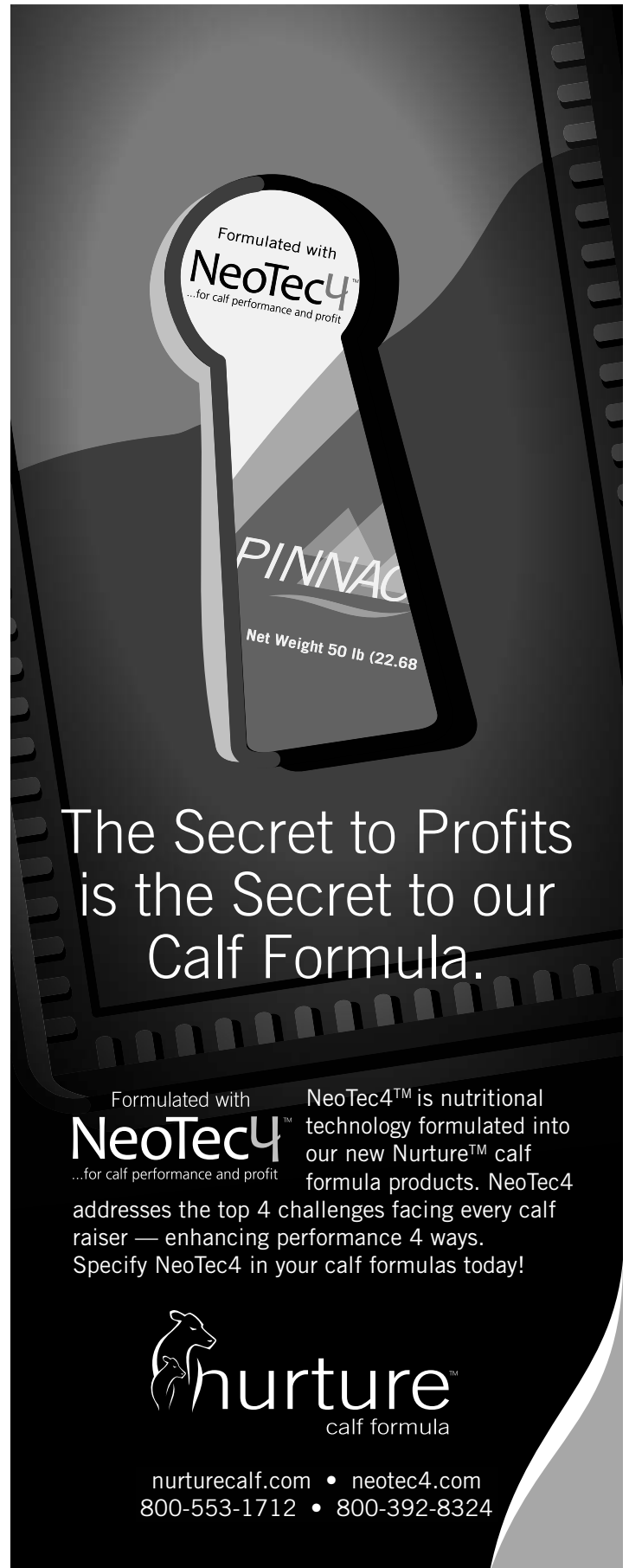
In numerous barn remodels, converting mattress barns into sand bedded barns, we have typically seen increases in milk production of the order of 1,000 to 4,000 pounds of milk per cow per lactation, with an average of around 2,000 pounds after about one to two years. We believe that this increase comes from a reduction in herd turnover rate due to improved lameness control, and the retention of older healthier cows in the herd. This leads to a re-stratification of the herd by age group and an increase in milk shipped per cow per day.

PART 3

The third and final article of this series will appear in the Aug. 26 issue of *Agri-View's Dairy's Bottom Line* and will discuss inadequate heat abatement and excessive time spent in lock-up—both challenges that deserve attention as they, too, can impact dairy cow health and productivity.


By Dr. Nigel B Cook
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Nutrient

Continued from page 1

\$3,960 if commercial N is valued at 44 cents a pound. Similarly, the nitrogen in the manure from 100 cows can be worth \$3,564. And the potassium in that manure is worth \$7,371.

Her second point is that “a nutrient management plan with a detailed manure spreading plan can reduce sediment and nutrient losses to water resources.”

“By knowing which fields need the nutrients provided by manure and what to do with manure during periods when there’s a high risk for water and manure to run off-potentially into the state’s water resources, you can use other options for manure during that time period,” she states.

While one option for managing manure during high-risk times is to temporarily stack it on a concrete pad, Radatz says a

second choice is to apply it to low-risk fields. These include fields that are relatively flat, need the nutrients the most and are not near streams, springs, ponds or lakes.

A third option is to apply manure so it only covers one section of a field at a time.

“Discovery Farms data shows that runoff is more likely in February and March than in early winter,” Radatz says. “Whether spreading liquid or solid manure, the shorter the time between an application and a runoff event, the greater potential for nutrient losses.

“Frozen, snow-covered ground can contribute a significant amount of nutrient losses if not managed carefully. Soil with a high moisture content, such as after precipitation or snowmelt, should also be managed carefully, to avoid losses. Important considerations for manure applications when the

soil is in this condition are the amount of water in the manure to be applied and the weather forecast.”

WHAT’S IN A PLAN?

Radatz says nutrient management plans typically contain six things: soil test results, cropping information, manure spreader calibration information, nutrient crediting, a detailed manure application plan and a soil conservation plan.

“Soil tests are possibly the most important part of a nutrient management plan,” Radatz says. “They can help you measure the current level of soil fertility, determine crop nutrient needs, and monitor changes in fields’ nutrient status. Soil tests should be current within the last four years.”

Cropping information in a nutrient management plan includes a field’s history of rotations, fertilizer and manure applications, yield goals and tillage practices.

As for manure spreader calibration, Radatz says, it’s “important so you can know how many tons or gallons per acre you are spreading. This allows you to take credit for the amount of nutrients applied to the field.”

Nutrient crediting, meanwhile, means considering the nitrogen legumes have put into the soil, along with taking into account the nitrogen, phosphorus, potassium and sulfur in manure applications.

A manure spreading plan helps pinpoint fields that need the nutrients for next year’s crop. It also helps a farmer designate the right time for applying manure to each field.

The sixth component of a nutrient management plan—the soil conservation aspect—has six parts. Radatz lists them as actual versus “tolerable” soil loss for each field, crop rotations, percentage of slope for each field, the percentage of residue on a field and the tillage that’s



Amber Radatz
UW-Discovery Farms

needed, soil maps, and aerial photos of fields.

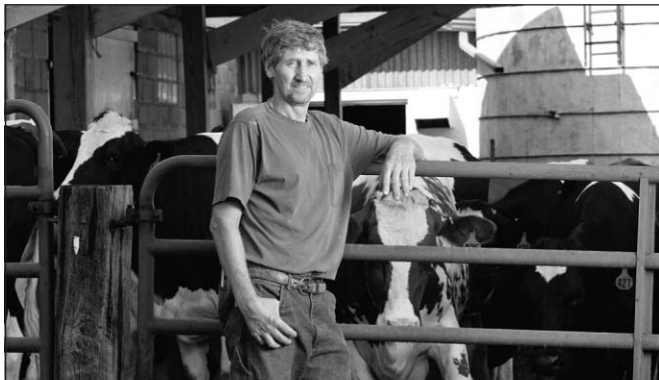
HELP AVAILABLE

“If your operation is small to medium-sized, and you’d like to devote some time to your nutrient management strategy, there are programs available through UW-Extension, local land conservation departments or technical colleges that enable you to write your own plan with the assistance of instructors,” Radatz states.

“If you’ve got a larger operation, seeking a private crop consultant to write your plan may be the best operation. This will be a higher monetary investment, but the plan will help you allocate nutrients and fertilize for yield goals more effectively.”

Radatz emphasizes that farmers planning to expand beyond 1,000 animal units and needing permits for their operations will need to work with a crop consultant. She suggests contacting your county Extension office to get going in the right direction. In addition, the nutrient and pest management program—at <http://ipcm.wisc.edu/>—through UW-Madison, has nutrient management specialists stationed around the state.

By Ron Johnson



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Ace Alfalfa Practices Yield More Profitable Forage

Getting the most from an alfalfa stand is a balancing act between growing a top-quality crop and maximizing yield. And, while forage quality directly impacts milk production, feed costs and ultimately farm profitability, a UW economic analysis underscores the importance of yield.

UW-Madison forage specialist Dan Undersander and other experts in the Upper Midwest provide several cutting-edge alfalfa-management tips.

Shorter alfalfa rotations can lead to greater profit per acre for the entire farm because of higher alfalfa yield and better forage quality, reduced pesticide use, greater nitrogen credits and increased corn yields.

Dr. Undersander and Extension educator Ken Barnett

pinpoint annual yield as the single most important factor determining profit, because inputs—including harvesting costs—change little as yield increases. The two agree that the relationship is so strong that farmers should do all they can to remain in the high yield range with their alfalfa.

One challenge, however, is declining yield as stands age—due to environmental stresses, wheel traffic and diseases. According to research, average yield decline of alfalfa in the Midwest is 17 percent in the third production year and 34 percent in the fourth.

Drs. Undersander and Barnett stress that producers should turn over their stands faster to stay in a high-yield range.

See Alfalfa on page 15



Alfalfa is a major profit center on most dairy operations. Getting the most from an alfalfa stand is a balancing act. UW forage specialists offer best management practices for increased alfalfa yields and profits.

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Fans

Continued from page 4

actual on-farm visits by Focus on Energy staff.

"When we go onsite, we use more detail—production levels, operation procedures, number of times milking and so on," he adds. "This allows us to put a better number on the cost savings that can be expected for your operation."

Step 3: Call Focus on Energy (800-762-7077) to develop an energy management plan.

"Our staff will ask some preliminary questions to determine what kind of help you need, then connect you to the resources that best address your particular energy concerns," Hackner explains. "When appropriate, you'll be partnered with one of our energy advisors... who can help you improve energy efficiency without compromising product quality or the comfort of your working or

learning environment."

Step 4: Team up with experienced market providers. Focus on Energy has a selection of companies located across the state that "specialize in energy conservation and efficiency product and services." It is their goal to match each producer with the best partners who are knowledgeable in Focus on Energy programs and incentives.

Step 5: Determine eligibility for incentives. Focus on Energy provides three possible categories of incentives: prescriptive, custom and service buy-downs.

Service buy-downs can be used to maintain equipment and can be applied for directly from a service provider.

Prescriptive incentives are centralized around "standard" efficiency measures, such as lighting. Hackner notes that these incentives are heavily utilized by "average-size



Photo by Shannon Hayes

Dairy farms of any size can benefit financially this summer with a few easy steps and tips for proper fan maintenance and energy efficiency.

Wisconsin dairy farms."

Custom incentives, Hackner states, are reserved for site-specific projects and are often used by larger dairies who utilize greater amounts and types of energy.

Step 6: Attend a Focus on Energy class or seminar. These educational opportunities are available at various locations across the state and strive to

offer the latest information about energy efficiency.

Hackner adds his own Step 7: "If you haven't called us, we are here. Even if you have worked with us in the past or you think you are the most energy efficient farm out there, there is always something we can find."

By Sara Schoenborn

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Handling

Continued from page 8

cattle with straight lines allows our movements to be very predictable to the cow," he states. "Always have a purpose and pattern to your movements."

Dr. Rapnicki says a defined purpose is most critical in confined areas, because cattle become nervous in tight quarters. When cows are in dark or small areas, every movement can make a significant impact on the livestock. Thus, he says, sure and slow actions are key.

While performing the correct movements take patience, repeating the movements each time cattle are moved will get them in the habit of trusting the handler. As creatures of habit, breaking cows out of their routine takes time. The before mentioned techniques are even

more important when moving cattle to new surroundings.

"Animals do not become afraid of gates or trailers or chutes," Dr. Rapnicki says. "We have told them not to go there."

Because the cattle are not used to moving in these areas, they are fearful of negative repercussions and added time is required to move the cattle properly.

"Understanding basic stockmanship skills is only the start," Dr. Rapnicki concludes. "Dairy workers need to approach every interaction as a chance to learn and improve their stockmanship skills."

"Anybody can be a person that works with cattle. It takes a commitment to communication with the cattle to be a stockman."

By Jeffrey Hoffelt

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Marketing

Continued from page 6

your herd. You have a structured, preventive program that you maintain regularly, with metrics that you keep a very close eye on. The same principle applies to marketing. You have to set up the structure and always be vigilant.

The approach we follow is to look at all the possible market scenarios that could unfold, and then prepare for them. We plan for what to do if the market goes up a little or up a lot or if it goes down a little or down a lot. We try to plan for all the possibilities. We know what we will do no matter which scenario unfolds. When you plan in advance, you take emotion out of your decision-making. You become more confident because you plan for uncertainty.

Who knows what will happen after the shock of 2009? Since the downturn in the market began in June of 2008, we've witnessed two points when it looked like everything was finally coming around, March and December of 2009. The market had a definite move higher and producers were a bit more optimistic about how things looked. Then the floor dropped out again. Simply put, predicting

the market is misplaced effort. Your efforts are much better spent on planning for whatever the market may do.

You can engage in marketing, even if you don't know exactly how it works when you start. What's most important is getting started. It means committing time to learning. Educate yourself on the basics of marketing tools. If you aren't an expert, find one to help you—just as you work with others to help keep your operation running smoothly. Call PDPW for details on future workshops and resources that can help you take the next step.

Neither the information presented, nor any opinions expressed constitute a solicitation of the purchase or sale of any commodity. Those individuals acting on this information are responsible for their own actions. Commodity trading may not be suitable for all recipients of this report. Futures trading involves risk of loss and should be carefully considered before investing. Past performance may not be indicative of future results.

By Mark Ludtke, dairy marketing consultant, Stewart-Peterson

Marketing?



Can I do it myself?



How can it help me?

How do I get started?

Is marketing too complex? Mark Ludtke challenges that statement, offering ways for any producer to get involved in today's markets.

Alfalfa

Continued from page 11

Research undertaken by the two analyzed the economic value of short-term alfalfa rotations compared to longer ones on whole-farm crop production, looking at a farm with 350 crop acres (160 in alfalfa) and either three- or five-year stands, including the establishment year. The researchers used state-average yields: 1) new seeding, 2.48 tons per acre of yield at \$158.62 per ton of dry matter (DM); 2) established stand, 4.5 tons at \$158.62 per ton of DM; 3) 85 acres of corn for grain (115 bushels at \$4.18 a bushel); and 5) 105 acres of corn silage (7 tons of DM per acre at \$102.34 per ton of DM). Their analysis includes all fixed and variable inputs, a land charge of \$72 an acre as well as a return to management.

At the conclusion of their

research, they found that average results result in close to breakeven regarding expenses and income.

They also found that seeding-year yield was 55 percent of the first production year.

Anything to increase yield in this year in this year is extremely beneficial to overall profit, say Undersander and Barnett, noting that alfalfa is profitable in the second and third years and after that, yield declines faster than costs and net losses occur.

The research showed that, across the board, higher yields tend to increase profits with little increase in costs. Equally as important, alfalfa increases profit of other crops in the rotation. The difference is especially dramatic for corn grain. (If corn is \$4.18 and N is 96 cents a pound, corn after corn loses about \$10 an acre. Following alfalfa, corn nabs a

profit of \$310 an acre because there's no need for N—other than starter—and because corn yields 10 to 15 percent more following alfalfa compared to corn-on-corn.)

Due to higher yields of both alfalfa and corn—for grain and silage—as well as reduced N costs, this UW pair highlight that farm profitability increased almost \$33 per acre for every acre of the farm with shorter alfalfa stand life.

While actual numbers will vary on individual farms, depending on their yields and costs of inputs, the above principles pertain to all farms. All will see improved profitability from shorter rotations, they state with confidence.

Dr. Undersander offers these “best management practices” for alfalfa:

- Select winter hardy varieties for less winterkill and less winter injury (i.e. more yield).

- Pick the establishment method best suited to your operation, be it direct seeding, oats with Poast Plus or Roundup or a companion crop of oats or ryegrass. There's no one best method for all.

- Keep in mind the causes of seeding failure: low pH (6.8 is the cutoff), loose soil, seeding too deep. Don't skimp on annual potassium.

- Harvest first cutting of new seeding early—take first cutting 60 days after planting for more additional cuttings and higher tonnage and fewer weed problems.

- Take first cutting in established stands by quality (i.e. Relative Feed Value drops quicker in first cutting than other harvests). A forage quality stick is a useful tool. First cutting is 40 percent of total yield across the season.

- Put forage into swaths for faster drying and higher total digestible nutrients (TDN).

- Research looking at the impact on mower type on stand and yield reveals higher average first-cut yield with a disc mower (1.49 tons per acre, versus 1.47 with a sickle cutterbar, according to Undersander). However, stand persistence in this research was the same for both mower types at 6.2 plants per square foot.

- Cut short to gain about a half-ton-per-acre of yield down to 1 1/2 inches. However, minimize “ash” (i.e. dirt), which lowers overall forage TDN.

- Assess stands and replace when thin. In terms of stem count, dry matter yield increases until about 55 stems per square foot and plateaus beyond that. Anything below 55 is limiting yield.

- Scout rigorously for potato leafhoppers and alfalfa weevil.

- Minimize wheel traffic damage by not driving on the fields. Use the smallest tractor for your equipment; merge windrows where possible; go to bigger equipment; take the most direct route to the edge of the field; make a road to drive on. In addition, do any driving on the field as soon as possible after harvest.

- Manage to dry forage quickly; do haylage or baleage; use a preservative and harvest wet hay.

Dr. Undersander doesn't recommend using duals, and he stresses that manure should be applied as quickly as possible after cutting. Trips across alfalfa fields damage the stand and reduce the following cutting's yield.

Additional alfalfa tips and information:

- Remember that yield is the most important component of alfalfa profitability. UW research has determined that fixed costs are the same regardless of yield. Production costs are similar and so are harvesting costs.



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See Alfalfa on page 16

Alfalfa

Continued from page 15

Profitability increases with yield as fixed costs remain constant and variable inputs increase only slightly as yield increases.

- The benefits of shorter rotations are great: Increased alfalfa yield from younger stands, increased corn silage yield following alfalfa, 10 percent to 15 percent higher corn yields following alfalfa, more legume credits and less rootworm insecticide following alfalfa.

- Comparing conditioners (flail/impellers versus rubber rolls), Dr. Undersander cites research showing flail conditioners have 2 percent to 3 percent higher field losses with alfalfa. "The loss is all leaves so field quality is significantly reduced," he notes, adding that growers

need to adjust their conditioner properly (tension and spacing on rollers).

University of Minnesota dairy scientist Jim Linn considers the time of day at harvest.

"Because plants accumulate soluble carbohydrates during the daylight, long sunny days will increase the sugar and starch content of plants," he reports. "After a sunny day, the sugar content of alfalfa will be highest in late afternoon and lowest in the morning. Sugar in the plant is utilized by the plant during nighttime hours.

Therefore, cutting in late afternoon minimizes sugar loss prior to harvesting.

Dr. Linn cites a recent study in Quebec that compared animal performance when late-lactation cows were fed afternoon-cut versus

morning-cut alfalfa harvested as baleage and fed with a vitamin and mineral pre-mix for 24 days. The study showed total nonstructural carbohydrate concentration (sugars and starches) was 2.3 percentage units higher when alfalfa was cut in the afternoon (12.8 percent versus 10.5 percent). Cows fed afternoon baleage ate more baleage and produced more milk. In addition, baleage digestibility was higher when harvested in the afternoon, and microbial protein synthesis was enhanced.

Dr. Linn cautions that cutting in the afternoon will, however, increase drying time.

In the Quebec study, alfalfa cut in the afternoon took 18 more drying hours compared to morning cutting.

Depending on weather and

the amount of harvesting you have to do, starting to cut alfalfa in the afternoon isn't always logistically possible, Dr. Linn concedes.

There are, of course, factors beyond the producer's control—the big one being weather.

Forages are typically higher quality in cooler growing conditions. Fond du Lac County crops and soils agent Mike Rankin notes that the effects of increasing temperature on alfalfa development include decreased stem diameter, accelerated rate of maturity, increased lignification, decreased digestibility, decreased plant height, decreased leaf to stem ratio and increased protein content.

By Jane Fyksen

"When we see land as a community to which we belong, we may begin to use it with love and respect."

- Aldo Leopold

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Ventilation Recommendations Depend on Barn Type

When it comes to ventilating freestall barns, the old real estate adage comes into play as to what's most important: location, location, location. That's because freestall barns get most of their fresh air and cooling from the natural movement of air through them.

"With natural ventilation, we're relying on the proper design and location of the building," states Brian Holmes, a professor and Extension specialist in biological systems engineering at UW-Madison.

By contrast, tiestall and stanchion barns rely primarily on mechanical ventilation. That means placing and using fans properly.

FREESTALL BARNs

Because it's difficult to move a freestall barn, it's important to

build it in the right place. Dr. Holmes' advice: "Build on a knoll, not in a hole."

The biological systems engineer points out that an elevated spot lets the wind blow through the barn. Still, he adds, the breezes get a better flow if the barn is also oriented correctly—ordinarily orienting it east and west since the primary wind direction is from the northwest during the winter, and from the south to southwest during the summer.

Dr. Holmes says it's also important to pay heed to nearby obstruction that might block the free flow of air through the barn. Potential obstruction items include trees, hills and two-story barns.

Although it is not nearly as important as the correct location and proper orientation of a

freestall barn, Dr. Holmes says design comes into play for ventilation purposes.

One criterion engineers use for freestall barns is 2 inches of ridge opening for each 10 feet of building width. For example, a barn that's 100 feet wide should have a ridge opening that's 20 inches wide.

Sidewalls should have the proper size openings, too. These openings can often be adjusted by the use of moveable "curtains."

"In the wintertime we want to have at least half of the size of the ridge opening width at each of the eaves, so 1 inch for every 10 feet," says Holmes. "We also want a minimum of a 10-foot sidewall height, and a 4:12 roof pitch."

During warmer weather, it should be possible to open the sidewalls—"ideally to 100

percent" per Dr. Holmes' recommendation. For barns wider than 60 to 80 feet, Dr. Holmes says, "You probably want to be more than the minimum sidewall height, 12 to 14 feet for some of the real wide ones."

Whatever the barn's size, the idea with ventilation is to "keep the air moving and get the ammonia, pathogens and dust out," reminds Holmes. A barn that's too tight can cause respiratory ailments in the cattle. And, a barn that's too warm can contribute to heat stress in its inhabitants.

"Proper design, proper position and natural ventilation go a long ways toward minimizing the effects of heat stress, as long as the wind is blowing," Dr. Holmes states.

See Ventilation on page 23

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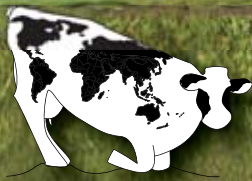
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UW Research Producing Insights On Cutting Edge Alfalfa Issues

Researchers at UW have been studying alfalfa yield and persistence on Wisconsin farms across multiple years. This work is raising some really interesting alfalfa management issues.

Researchers are finding that producers are harvesting alfalfa for bunkers and pile silos at moistures well above what's recommended for optimum fermentation and silage porosity. For the past three years, alfalfa DM at harvest (seasonal average) by year was 49.8 percent (2007), 47.1 percent (2008) and 48.8 percent (2009).

"Conversely, many nutritionists are recommending drier alfalfa haylage to offset the wetter corn silage component of the diet, decrease the percentage of soluble protein and to avoid any change of butyric acid formation," says Mike Rankin, Fond du Lac County crops and soils agent on behalf of the UW's Team Forage of agents. "Clearly the latter strategy is being followed on these (research) farms and presumably many others."

In this statewide project, researchers are also looking at the profitability of a fifth cutting in October. During 2007 and 2008, the yield averaged 0.58 ton per acre.

Rankin then poses this question: "Given the potential for reduced yield in the subsequent growing season and the cost of harvesting such a small amount of forage per acre, is such a practice viable in Wisconsin?"

He continues, "Perhaps the 'need for feed' might justify the practice in some years, but long term, it's likely not a

sustainable or profitable management practice."

Just how much does taking a late-fall, fifth-crop harvest cut into yield of the first cutting the following spring? Rankin says, "Research indicates the reduction is at least equal to the yield of the fall harvest. This reduction is caused by reduced plant vigor or, in extreme cases, plant death from winterkill."

He adds that even second-year first-cut yields were lower in this producer-fields study when fields had been cut late fall the year before.

Rankin brings up one more issue: When is forage quality too good?

"The 'knock' on alfalfa is that dry matter yield doesn't compete with corn silage," he explains.

"One strategy to increase yield is to simply delay harvest. Such a strategy lowers forage quality. But the more important consideration is whether or not a little lower quality is an acceptable tradeoff for a lot more yield—especially in the spring.

"For every five days in late May alfalfa yield increases by 0.25 tons per acre and RFQ (Relative Feed quality) decreases by 20 to 25 points. These are averages and actual values will vary with weather conditions. If the alfalfa is somewhere north of 200 RFQ—as it was in some of these project fields, then waiting for a bump in yield is probably a good tradeoff. Conversely, if the alfalfa is 160 RFQ, then the tradeoff doesn't look nearly as good."

By Jane Fykse



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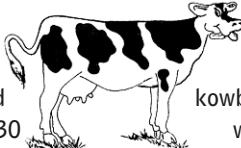
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Ventilation

Continued from page 18

"However, there are times in the summertime when the wind doesn't blow, and that's when people start putting in supplements to the natural ventilation."

Those supplements are, of course, fans and sprinklers. Two types of fans are used: high-velocity fans and low-speed, high volume fans.

Dr. Holmes explains that high-velocity fans are "smaller fans that are mounted above the cows and blow at a downward angle. The current recommendations for those are no farther apart than 10 times the fan diameter." That means 2-foot-wide fans should be spaced no more than 20 feet apart, and 3-foot fans should be mounted no more than 30 feet apart.

Researchers have been trying to identify the best places to mount these fans.

"Since cows spend a lot of time lying in the stalls, and, since you want them to lie in the stalls as much as possible, putting these fans over the stalls is very beneficial," Dr. Holmes says.

"When producers first started putting fans in, they would often locate them over the feed manger because that's where they were also putting sprinklers. But you can't put sprinklers over the stalls without getting wet stall beds. It's logical to have air velocity where you also have wet

cows. You get some real benefit from moving the air past the animals when they're wet, to help with evaporative cooling."

The second type of fans—low-speed, high-volume fans also called "helicopter" fans—use less energy for the amount of air they move per minute. As their name implies, these fans turn slowly but disturb comparatively large amounts of air.

"If these fans are above the cows, they probably can have some benefit," Dr. Holmes states. "But they're often retrofitted into a barn.

"Consequently, the ability to locate them above the cows is limited by the superstructure that supports the roof. So the only place they might have enough space is in the alleyway."

Because the alleyway is one of the last places a farmer wants cows to congregate, hanging helicopter fans above the stalls is a better bet.

Dr. Holmes notes that producers should not worry much about air flow rates in freestall barns. In those barns it's the speed of the air that counts, not the volume.

"It isn't until you start exchanging air—inside to outside—that we start talking about cfm (cubic feet per minute) per animal," Dr. Holmes states. "The barn has its own air exchange process, with natural ventilation. It's impossible to specify what it should be, because you're at the mercy of the wind."

TIESTALLS, STANCHIONS

On the other hand, Dr. Holmes says, "We do have recommendations when it comes to mechanical ventilation." That's the type usually used in stanchion barns and tiestall barns. And that means using fans to move air.

The ag engineer notes that there are some Canadian designs for tiestall and stanchion barns that use natural ventilation, but, he says, it's practically impossible to incorporate the ideas into most two-story barns. That's because they are two-story, with a hay mow above, or because they have another structure, such as a lean-to, on the side.

That means the best way to ventilate these two-story barns is with fans and air inlets that have been properly designed and that are built in the correct locations.

But, Dr. Holmes adds, "Most of the barns I've been in don't have any of that. So historically, ventilation has been to add another fan, irrespective of what the inlet

system is going to be."

Dr. Holmes offers several recommendations for fans in tiestall and stanchion barns. (Numbers are provided by the Midwest Plan Service.)

In cold weather, fans should continually move 50 cubic feet of air per minute for each 1,400-pound cow that's in the barn. During "mild" weather, the number climbs to 170 cubic feet per minute. And, during hot weather, the number rises to 470 cubic feet per minute for each 1,400-pound cow.

Dr. Holmes says producers wanting more information about the numbers and locations of fans in their stanchion and tiestall barns should contact their local Extension office. As mentioned earlier, the answers are much easier to come by with naturally ventilated barns. In those, says Holmes, "Open everything you can, to take advantage of the wind."

By Ron Johnson



Photo by Shannon Hayes

Dairy facility ventilation depends greatly on location and structure. Both are equally important to allowing for maximum air flow and efficiency.



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