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FEEDER INFORMATION HIGHLIGHTS

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September/October 2016



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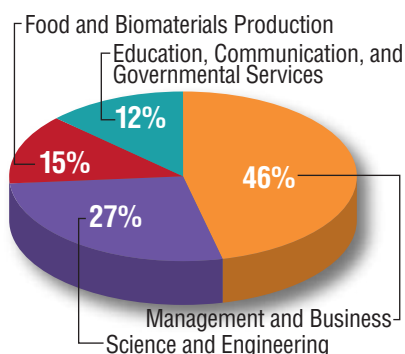
**2-DAY
SETUP!**

WHO'S GONNA FILL THEIR SHOES?

A few weeks ago, I watched my 19-year-old load her truck and head down our dirt road on her way to her second year of college. She takes with her lessons learned on the family ranch, a work ethic second-to-none developed by long days tending to cattle and horses, and a passion to "do something" in agriculture.

A report in 2015 finds there's

Employment Opportunities



high demand, at least for the foreseeable future, for college graduates with agricultural degrees. Data from the USDA and Purdue stated that an average of nearly 60,000 highly-skilled ag and related job openings are expected annually in the United States over the next five years, with only about 35,000 graduates in food, ag and renewable resources graduating each year to fill them.


The opportunities in agriculture are multi-fold and are a result of expanding opportunities that technology has brought to the table, as well as an aging workforce, of which one-fourth is 55 and older. A CNBC report detailed that Iowa State University's agriculture 2014 graduates joined the workforce with an average starting salary of \$48,000, with around half earning \$50,000 in their first job.

Perhaps a more challenging side of the equation is how are young graduates going to get their foot in the door of production agriculture? Entry expenses are extremely high, with land and equipment prices topping the list. An article in last month's FEED•LOT discussed how some have lost equity in the volatile markets of the last few years. Established businesses and people near retirement age are scratching their head as they navigate the future.

Somehow, our industry must tap into this young, enthusiastic work force of the future. Somehow we must help them get a leg up, despite expensive entry costs. Maybe it involves taking a young agriculturalist under your wing and partnering with them on a business venture. Your experience, expertise and stability can compliment their enthusiasm and entrepreneurial spirit. Despite the challenges, we must find a way to help those interested in agriculture establish themselves for the future.

"There is incredible opportunity for highly-skilled jobs in agriculture," said Agriculture Secretary Vilsack. "Those receiving degrees in agricultural fields can expect to have ample career opportunities. Not only will those who study agriculture be likely to get well-paying jobs upon graduation, they will also have the satisfaction of working in a field that addresses some of the world's most pressing challenges. These jobs will only become more important as we continue to develop solutions to feed more than 9 billion people by 2050."

- Who's gonna fill their shoes?
- Who's gonna stand that tall?
- Who's gonna feed the cattle
- And grow the crops this fall?
- Who's gonna give their heart and soul
- To feed me and you?

Lord I wonder, who's gonna fill their shoes? 

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¹ Sifferman RL, Wolff WA, Holste JE, et al. Field efficacy evaluation of gamithromycin for treatment of bovine respiratory disease in cattle at feedlots. *Intern J Appl Res Vet Med*. 2011;9(2):171-180.

² Lechtenberg K, Daniels CS, Royer GC, et al. Field efficacy study of gamithromycin for the control of bovine respiratory disease in cattle at high risk of developing the disease. *Intern J Appl Res Vet Med*. 2011;9(2):189-197.

³ ZACTRAN product label.

⁴ Kahn, CM. *Merck Veterinary Manual*. 10th edition. 2010:1319.

⁵ Van Donkersgoed J, Merrill JK. A comparison of tilmicosin to gamithromycin for on-arrival treatment of bovine respiratory disease in feeder steers. *Bovine Practitioner*. 2012;46(1):46-51.



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INDICATIONS

ZACTRAN is indicated for the treatment of bovine respiratory disease (BRD) associated with *Mannheimia haemolytica*, *Pasteurella multocida*, *Histophilus somni* and *Mycoplasma bovis* in beef and non-lactating dairy cattle. ZACTRAN is also indicated for the control of respiratory disease in beef and non-lactating dairy cattle at high risk of developing BRD associated with *Mannheimia haemolytica* and *Pasteurella multocida*.

CONTRAINDICATIONS

As with all drugs, the use of ZACTRAN is contraindicated in animals previously found to be hypersensitive to this drug.

WARNING: FOR USE IN CATTLE ONLY. NOT FOR USE IN HUMANS. KEEP THIS AND ALL DRUGS OUT OF REACH OF CHILDREN. NOT FOR USE IN CHICKENS OR TURKEYS.

The material safety data sheet (MSDS) contains more detailed occupational safety information. To report adverse effects, obtain an MSDS or for assistance, contact Merial at 1-888-637-4251.

RESIDUE WARNINGS: Do not treat cattle within 35 days of slaughter. Because a discard time in milk has not been established, do not use in female dairy cattle 20 months of age or older. A withdrawal period has not been established for this product in pre-ruminating calves. Do not use in calves to be processed for veal.

PRECAUTIONS

The effects of ZACTRAN on bovine reproductive performance, pregnancy, and lactation have not been determined. Subcutaneous injection of ZACTRAN may cause a transient local tissue reaction in some cattle that may result in trim loss of edible tissues at slaughter.

ADVERSE REACTIONS

Transient animal discomfort and mild to moderate injection site swelling may be seen in cattle treated with ZACTRAN.

EFFECTIVENESS

The effectiveness of ZACTRAN for the treatment of BRD associated with *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni* was demonstrated in a field study conducted at four geographic locations in the United States. A total of 497 cattle exhibiting clinical signs of BRD were enrolled in the study. Cattle were administered ZACTRAN (6 mg/kg BW) or an equivalent volume of sterile saline as a subcutaneous injection once on Day 0. Cattle were observed daily for clinical signs of BRD and were evaluated for clinical success on Day 10. The percentage of successes in cattle treated with ZACTRAN (58%) was statistically significantly higher ($p < 0.05$) than the percentage of successes in the cattle treated with saline (19%).

The effectiveness of ZACTRAN for the treatment of BRD associated with *M. bovis* was demonstrated independently at two U.S. study sites. A total of 502 cattle exhibiting clinical signs of BRD were enrolled in the studies. Cattle were administered ZACTRAN (6 mg/kg BW) or an equivalent volume of sterile saline as a subcutaneous injection once on Day 0. At each site, the percentage of successes in cattle treated with ZACTRAN on Day 10 was statistically significantly higher than the percentage of successes in the cattle treated with saline (74.4% vs. 24% [$p < 0.001$], and 67.4% vs. 46.2% [$p = 0.002$]). In addition, in the group of calves treated with gamithromycin that were confirmed positive for *M. bovis* (pre-treatment nasopharyngeal swabs), there were more calves at each site (45 of 57 calves, and 5 of 6 calves) classified as successes than as failures.

The effectiveness of ZACTRAN for the control of respiratory disease in cattle at high risk of developing BRD associated with *Mannheimia haemolytica* and *Pasteurella multocida* was demonstrated in two independent studies conducted in the United States. A total of 467 crossbred beef cattle at high risk of developing BRD were enrolled in the study. ZACTRAN (6 mg/kg BW) or an equivalent volume of sterile saline was administered as a single subcutaneous injection within one day after arrival. Cattle were observed daily for clinical signs of BRD and were evaluated for clinical success on Day 10 post-treatment. In each of the two studies, the percentage of successes in the cattle treated with ZACTRAN (86% and 78%) was statistically significantly higher ($p = 0.0019$ and $p = 0.0016$) than the percentage of successes in the cattle treated with saline (36% and 58%).

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LESSONS LEARNED

Feeding Cattle Under Roof



More and more cattle feeders are finding benefits in feeding under roof. In Iowa, where Jeff Pastoor and Scott Roskens with Quality Liquid Feeds recently presented at a series of BeefMeets hosted by the Iowa Cattlemen's Association, the trend is picking up steam at a record pace.

"We've certainly had a boom here," says Pastoor, "mostly driven by water quality compliance." The EPA and Iowa Department of Natural Resources are hitting feeders with more stringent regulations, and many, when faced with the cost of a concrete settling basin, are finding roofed structures to offer more benefits for the same money, whether they are hoop buildings, monoslopes, or gable roofed buildings.

"For producers in the southwest where it is dry most of the time, an open lot may still make sense," says Pastoor, "but for anyone who has to deal with mud, these structures create an opportunity to not only comply environmentally, but increase performance."

Pastoor presented data from a

large, peer reviewed closeout analysis that showed cattle fed under roof improved Average Daily Gain by .13 pounds, and improved dry matter feed conversion (DM F/G) by nearly .5 pounds.

"We're able to eliminate the stress of extreme heat and cold as well as mud," says Pastoor. "In the spring and fall of the year performance numbers look about the same. But cattle lose efficiency in the winter and most beef breeds, with their long hair and thick hides, don't perform well in summer heat. Protection from the elements helps equal out those factors."

Heat, in particular, is a problem. "Digestion creates internal heat," explains Pastoor. "When air temps are hot as well, cattle won't eat, and don't gain. We know comfortable cattle respond with better performance."

Opinions vary as to the best type of building to optimize those benefits. "It really comes down to what the producer has confidence in," says Pastoor. "If he has an attitude toward a particular type, he'll manage it well and make it work."

A properly designed confinement

unit keeps animal comfort, performance and welfare in mind by eliminating deep mud, social stress due to overcrowding, and exposure to weather elements.

Pastoor says a steeper roof design and a narrower building will improve air quality and may allow for greater stocking density when compared to a hoop structure. "If you know how to manage your building, the cattle will tell you what stocking density works," he adds.

For bedding barns, some propose 40-45 square feet per head. Pastoor says in his experience he has seen barns that work at 27 square feet, and others that need 50 square feet. He explains that building depth, roof shape and pitch, open sides and air changes will all affect space and bedding requirements – in general Holsteins will need 30 percent more space than beef breeds. If manure tagging is extreme animals are likely overcrowded or do not have enough bedding.

"Allow your cattle to show you," he reiterates. "Keep good records, and make adjustments for big cattle."

Bedding choice can also affect Quality Grade. Studies from North Dakota State and Colorado State show the percent of cattle grading Choice improves with the bedding supply. For the NDSU study, the quantity of bedding needed to keep animals comfortable was considered a "modest amount." A "generous amount" was twice as much.

The study showed no difference in gain performance related to bedding quantity, but a marked



difference in grade. In the NDSU study, 45 percent of cattle with modest bedding graded Choice, while 63 percent of cattle with generous bedding graded Choice.

"With more generous bedding, the animal uses less energy for maintenance, and that allows more marbling to deposit," explains Pastoor.

Bedding type can make a difference in cattle comfort. Corn stalks are most commonly used, and a base of soybean straw underneath the cornstalks will improve their moisture holding capacity. But Pastoor says if wheat straw is available it will last twice as long. Using a bale processor can also reduce the amount of bedding required by nearly half. Whatever material is used, it needs to be sufficient to help keep building moisture down. Building design and proper separation between buildings will also help keep the building dry. Distance between buildings should be at least 1.5 times the building depth.

For the farmer/feeder, manure quality can be an important issue

when deciding on building type, or making the decision to feed under roof vs. outdoors. Liquid manure collected through a slatted floor allows for handling in liquid form, requiring less labor and saving the bedding cost. But the form doesn't affect manure quality. "We know what nutrients go in and what nutrients come out, and it's the same in both barns," says Pastoor. And what comes out is good fertilizer. Feeders moving under roof can look for an improvement in manure quality with a typical high protein diet rich in co-product.

They can also expect more manure. "It's collected in a concrete box with a roof," says Pastoor. "You're not losing anything."

He says the money is in the quantity, though he generally doesn't factor in profit from the resource when calculating the cash flow of a project. "But, knowing you have the resource on top of the cash flow can give your lender added confidence." For many farmer/feeders the benefit is not in selling manure, but in saving on fertilizer expense. "Most producers are pretty self-contained. They build their livestock facilities the best size to fit the land base," says Pastoor.

Even with consideration of the variables, feeding cattle under roof has stood the test of time and profitability, proving there are benefits for feeders and for the cattle. "When there's no stress, life is good," says Pastoor, "leaving the animal to eat and gain."

FL



Silage safety is top priority

It's the 911 call no one wants to make.

An injury or death at a farm or feedyard is always tragic, yet often preventable. One source of accidents is a silage pit, and taking routine precautions around the area can prevent many unnecessary accidents. Kansas State University Professor Emeritus Dr. Keith Bolsen and his wife Ruthie have spent the last several years increasing awareness of silage safety.

"It's our number one silage problem, globally," Bolsen told the audience at this summer's Husker Corn Silage Conference, sponsored by Lallemand Animal Nutrition, University of Nebraska Lincoln and Iowa State University Extension. "We have nothing to lose by practicing safety first. But we have everything to lose by not practicing it."

Bolsen said there are multiple hazards when managing silage in bunker silos and drive-over piles, including tractor or truck roll overs, entanglement/run over by machinery, collapsing silage, nitrogen dioxide exposure and complacency.

Ohio State Extension Educator Rory Lewandowski wrote in a silage safety article that the first point in silage safety is to recognize that silage avalanches are real and there is no way to predict when and where they will occur. Although a rough or uneven silage face, or one that has been undercut, is more likely to have an avalanche, even a well maintained smooth silage face could have part of the face fall away.

Safety rules should be implemented for the operation to ensure all workers understand the risks around silage. Suggested silage safety rules from a Lallemand

Technical Bulletin include:

1. Keep a Safe Distance.

Workers should not stand closer to the face than three times its height. Equipment and people near the feedout face are in danger. Post warning signs to ensure visitors and bystanders observe the safe distance rule.



2. Bring a Buddy.

Never work in or near a bunker pile alone. In the event of an accident, another worker in the area can alert officials to the problem. People have died and were discovered under fallen silage as a "process of elimination" when they could not be located, wasting precious recovery time.

3. Fill Safely.

Don't fill a bunker higher than unloading equipment can safely reach. Use caution when covering bunkers and operating equipment.

4. Maintain Carefully.

Use caution when removing plastic, tires, tire sidewalls or gravel bags. When working in an over-filled

bunker or pile, always wear a harness connected to a safety line.

5. Feedout Correctly.

Never dig the bucket into the bottom of the silage, creating an overhang. Never drive the unloader parallel to and in close proximity of the feedout face of an over-filled bunker or pile.

6. Be wary of silage gases.

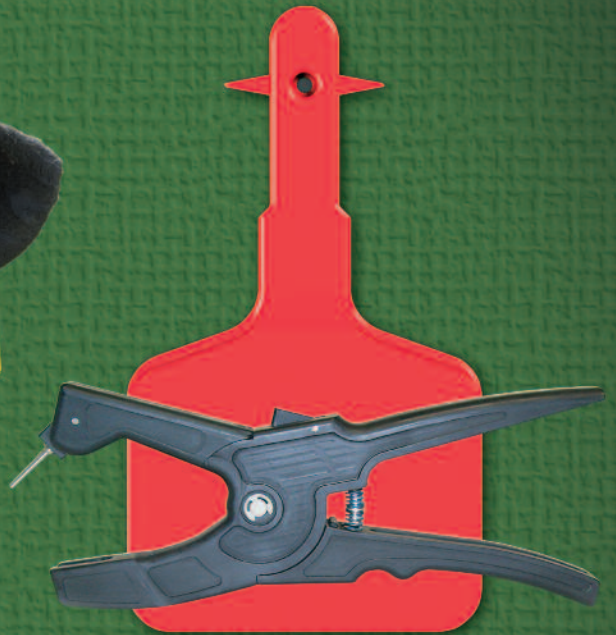
If orange or brown gas is seeping from the silage, allow it to fully dissipate before approaching the silage. Orange or brown gas is highly toxic. Carbon dioxide is colorless, but can also be very dangerous due to the risk of asphyxia.

Individuals taking silage samples from the face of the pile are in the danger zone for an avalanche. Donna Amaral-Phillips, Extension Professor with the University of Kentucky said instead of collecting samples at the face of the silage, the feed should be removed across the face of the silo using the normal method of removing silage (i.e. tractor bucket, etc), added to the TMR wagon without any other ingredients, allowed to mix and then discharged on the feeding pad away from the face of the silo. Then, she said, samples can be safely collected for nutrient analysis.

Lallemand Animal Nutrition has a Silage Safety Handbook available to producers, as well as safety signs and additional information. Producers can go to <http://qualitysilage.com/safety/> to request safety materials for use on their operation.

"It's really not about shrink loss, feed conversion, cost of gain or a close out. It's about sending everyone in your silage program home to their family safe, everyday," Bolsen said. "Let's make silage safety a very high priority." **FL**

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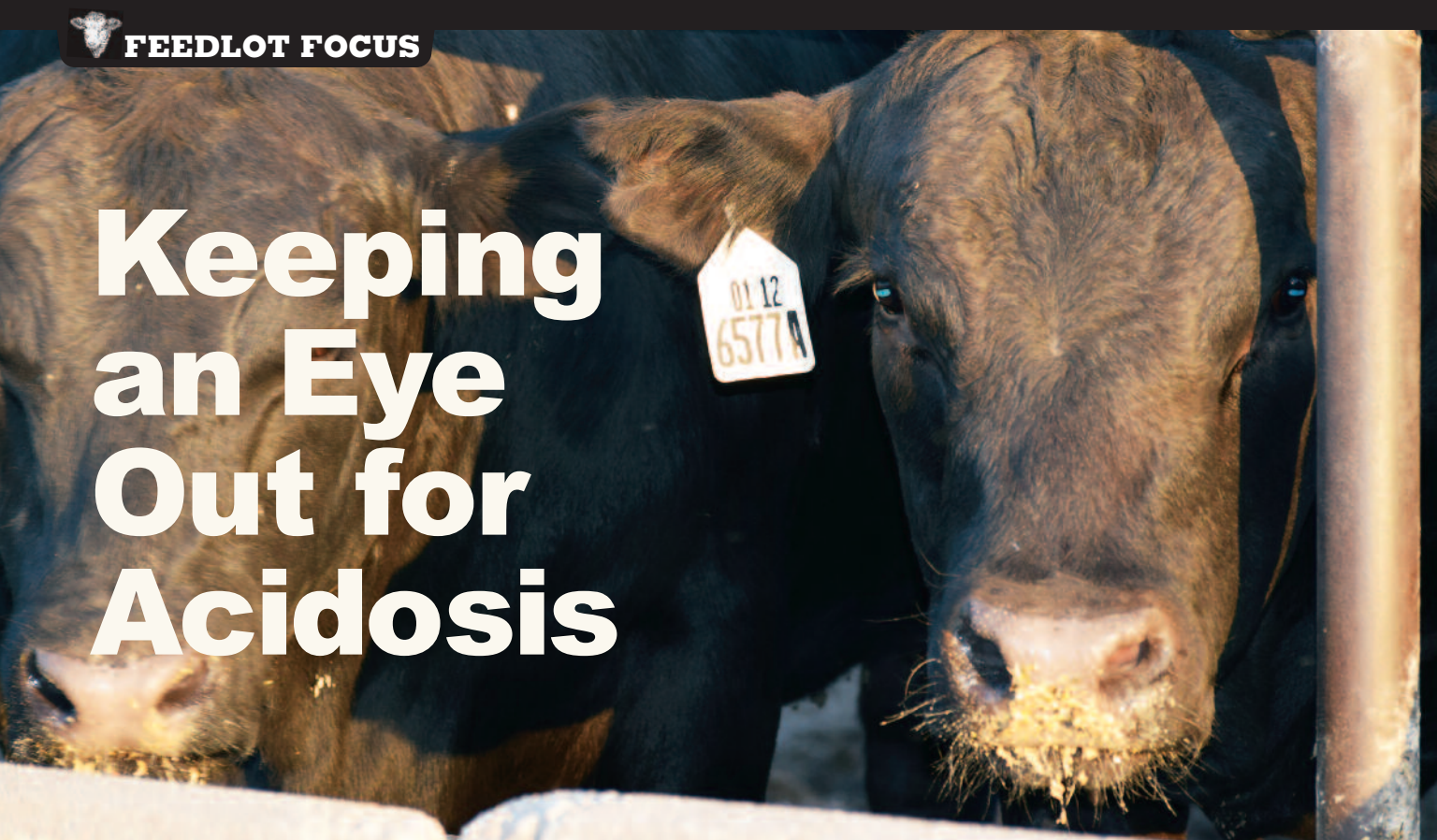
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Keeping an Eye Out for Acidosis



We've all seen it: that one steer standing in the dry lot looking miserable, staring into nothingness with its head down like his favorite football team just lost a national championship. A football disappointment would be a less costly diagnosis, but this case is likely acidosis.

Acidosis is the most commonly seen nutritional disorder on cattle operations. However, it can be prevented fairly easily with close monitoring through good bunk management practices, adequate water sources, and attention to feed grind and particle size.

"Acidosis is often the common denominator for many nutritional challenges on-farm," explains Justin O'Flaherty, a nutrition analytic consultant for Rock River Laboratory. "Some producers assume sodium bicarbonate will fix their problems, but it is a relatively weak buffer, especially in high-grain diets."

Acidosis occurs when a highly processed diet is fed, and when intake is not limited. The rumen pH

drops, causing decreased rumination. In turn, less saliva is produced, reducing buffering capacity. The rumen pH of animals consuming forages is generally between 6.5 – 7, while the rumen pH of animals consuming grain is generally 5.6 – 6.2. When cattle become acidotic, their rumen pH falls to 5.0 – 5.8 for a prolonged period of time, which can cause irreparable damage to the rumen papillae. These papillae are important for absorbing Volatile Fatty Acids (VFAs).

To prevent acidosis, rather than the expensive challenge of identifying and treating it after the fact, O'Flaherty offers a few producer tips:

Manage the bunk

Bunk management is the most important factor in trying to prevent acidosis in cattle. O'Flaherty recommends feeding twice a day — ideally at the same time every day. Using a bunk scoring system can help keep an eye on cattle and aid with feed efficiency.

"I cannot over-emphasize the importance of walking feed bunks and

identifying feed refusals," says O'Flaherty. "Growing up with a feedlot nutritionist father, we were always taught to use a stair-stepping method. If cattle left feed in the bunk on Thursday, we would bump their feed down a little on Friday. If they cleaned up all of their feed on Friday, we would bump them back up and give them a little more on Saturday." Creating consistency in feed intake can increase feed efficiencies and gains while decreasing the risk of acidosis.

Dial in feed and forage intake

Avoiding overeating hay is just as important as avoiding overeating grain. Round bales are considered free choice and not ideal. "If you must use a round bale, turn cattle in with the bale for 15 minutes and then restrict their access," says O'Flaherty.

She goes on, "cleaning up feed refusals is essential, as is making sure cattle don't have feed in front of them 24 hours a day." Not only can this strategy improve intake efficiency, and thus average daily

gains, but it also helps cattle avoid engorgement – and thus acidosis.

Increase grind size

“A common problem I observe in small operations is grain-based feed with too small of a grind,” states O’Flaherty. “Processed feed, especially grains, should not look like chicken feed.” The safest grinding goal O’Flaherty recommends for dry corn is splitting the kernel in half, or quarters. This offers a wide range of particle sizes for bacterial attachment and digestion over a longer period of time.

“I would recommend not putting a screen in a grinder,” states O’Flaherty. “If you are unsure of your particle size, a lab analysis can help you determine the proper grind size for your operation’s needs.”

Get serious about water variables

“The rumen contents are 88% water, so when water intake decreases, so does feed consumption,” says O’Flaherty. “For every one pound of dry matter intake cattle need seven pounds of water.”

Water temperature can also play a role in acidosis prevention. O’Flaherty recommends keeping water in the optimal temperature range for rumen functionality. “As the rumen functions at 102 degrees Fahrenheit, the ideal water temperature is between 40 and 60 degrees Fahrenheit. Any water consumed at a higher or lower temperature than that range can slow digestion or reduce intake.”

Analyze for total dissolved solids

Be aware of total dissolved solids in the water. If not observed, these pieces of sediment in water can wreak havoc on cattle. “A rate of over 5,000 parts per million of total dissolved solids can kill cattle as it settles in the rumen, essentially plugging it,” says O’Flaherty. “Testing water for this every six months is a good idea - especially during hot weather, as the cattle will tend to spend most of their day in ponds.”

Identifying acidosis can be difficult for some. Bloat, lack of feed consumption, weakness and listlessness, occasional kicking at the belly, and grey manure are all symptoms of acidosis and a veterinarian should be consulted as soon as any of these indications are observed. Even if caught early and the affected animal survives, longstanding health problems are still likely.

While these risks for acidosis are abundant, they can be curbed and prevented. Cattle managers should make sure to avoid acidosis if at all possible, as the associated costs add up quickly. Good management and prevention can make or break an operation, so may the rumen pH and your cattle’s gains be ever in your favor!

FL



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Probiotic strain *Lactobacillus acidophilus* BT-1386, available exclusively from Lallemand Animal Nutrition, was added to the 2015 pre-harvest production best practice (PBP) document released by the Beef Industry Food Safety Council (BIFSCo). It is commercially available for purchase under the brand names **Micro-Cell FS** and **Micro-Cell FS Gold**.



1 Production Best Practices (PBP) to Aid in the Control of Foodborne Pathogens in Groups of Cattle. Beef Industry Food Safety Council Subcommittee on Pre-Harvest, Spring 2015. Accessed March 19, 2015.
2 Tabae ES, Oloya J, Doekott DK, Bauer ML, Gibbs PS, Khaitsa ML. Comparative effect of direct-fed microbials on fecal shedding of *Escherichia coli* O157:H7 and *Salmonella* in naturally infected feedlot cattle. J. Food Prot. May 2008; 3(71): 539-544.
3 Lallemand Animal Nutrition. Unpublished. United States. 1996.
4 Hutcheson D and Lallemand Animal Nutrition. Unpublished. United States. 1986.

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Fighting pink eye in cattle

A K-State beef veterinarian discusses methods to combat the disease

While the summer months are winding down, pink eye can still be a concern for cattle producers. A.J. Tarpoff, K-State Research and Extension beef veterinarian, has tips to help minimize the effects of this disease in cattle.

Weaned calves may lose up to 10 percent of their body weight as a result of the disease, according to Victoria Agriculture (Australia). The disease may lead to blindness and possibly even death due to starvation, thirst, and accidents due to loss of sight.

Causes

Pink eye is caused by several factors working together, Tarpoff said. The main cause is the ever-changing bacteria, *Moraxella bovis*. Many subtypes of that bacteria can be found even within one infected animal, which contributes to difficulty in treating it.

Other factors include, UV light, which irritates the eye, tall foliage such as grass or weeds which can scratch the eye, and dust which acts as a direct irritant.

"Flies work to cause pink eye in two different ways," Tarpoff said. "First, they can irritate the eyes directly by flying around and irritating the cornea. Secondly, flies directly feed on the secretions from the eye. Once they feed off of those secretions, they pick up the bacteria and take it over to another animal and infect that animal, too."

Detection and treatment

Tarpoff suggests producers think of early detection as if they themselves were poked in the eye and had the associated side effects. An infected animal will often show the same symptoms: discomfort, tears, straining to open the eye, and possibly the eye staying shut.

One guaranteed sign is increased tearing, he said. Often dirt

will get attached to the tear stains. This is especially visible in light colored cattle.

There is no set time period from once the disease is evident until it is a threat to the health of the eye.

"As the disease progresses it develops an ulcer typically in the center of the eye," Tarpoff said. "Either one or two things happen - it starts to heal or it builds up pressure on the inside of the eye from the inflammation and possibly ruptures."

"The biggest treatment option I recommend is to work with your veterinarian as they are familiar with what is happening in the area as well as what is and is not working," he said. "Working with your veterinarian also gives producers a chance to establish a veterinarian-client patient relationship, which is extremely important when treating animals with antibiotics."

"The mainstay treatment that has been used for years is injectable oxytetracycline," Tarpoff said. "It still has a very good level of effectiveness however, by working through a veterinarian he or she may be able to take samples if a producer is experiencing a large outbreak. There may be different bugs in the eye that may need a different type of treatment."

He also recommends gluing a patch over the infected eye. This minimizes solar radiation exposure and other irritants so the eye is more comfortable. In addition, it covers secretions from the eye so that flies cannot transmit the bacteria to other animals.

The length of recovery time generally comes down to the severity of the infection and individual variability. If the animal is immunocompromised for any reason, it won't respond like it should regardless of antibiotic use. If the animal is otherwise healthy, it should

respond well to early treatment.

Preventative care

A preventative herd health program through a veterinarian aids producers in keeping optimal herd health, Tarpoff said. A proper vaccination program manages viruses such as infectious bovine rhinotracheitis, commonly known as IBR, and bovine viral diarrhea, or BVD, that can affect the severity of pink eye.

"There are several options for vaccines to control pinkeye," the veterinarian said. "Some issues with vaccines are they are given too close to when the animal becomes infected. It takes two doses and several weeks to build immunity."

Moraxella bovis has many types and sub types, which also presents challenges. Vaccines only have certain strains and are not all cross protective. In some cases they are very helpful but if given too late in the year or if a vaccine is for a different strain, it will not work.

Proper nutrition assists in preventing pinkeye. Assuring an animal has all of the essentials to perform well helps to keep its immune system functioning.

Fly control is also essential, Tarpoff said, since flies spread the disease rapidly. Effective fly control plans may include insecticide sprays, special ear tags, or cattle rubs.

Environmental controls to prevent the spread of pink eye include cleaning areas where flies reproduce such as in stagnant pools of water and areas where manure builds up. Clipping pastures may also help – when cattle graze in tall forages they may scrape their eyes and get the disease. Trimming grasses reduces a physical irritant to the eye. It's also helpful for cattle to have shade from the UV radiation found in direct sunlight. **FL**



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HIGH MOISTURE CORN MANAGEMENT

As harvest approaches and cattle feeding margins remain negative, take the opportunity this harvest to get the most out of your corn crop. If putting up high moisture corn (HMC) is part of your repertoire, I am going to challenge you to manage the entire process in order to achieve success. From an agronomic standpoint, HMC expands the harvest season and reduces in-field grain loss by 3-6%. From a feeding standpoint, HMC improves both gain and conversion while typically resulting in less shrink than dry corn.

While the benefits of HMC are apparent for both farming and feeding operations, success is in the details. Most importantly, HMC must be stored at the right moisture level to maximize cattle performance. The ideal moisture range for harvesting HMC is 28-32% moisture, with maximum energy density and cattle performance between 30-31% moisture. Once the kernel reaches black layer, HMC harvest can and should begin in order to realize the most value. Timing is critical because by the time corn dries down to 23% moisture, it will feed with essentially the

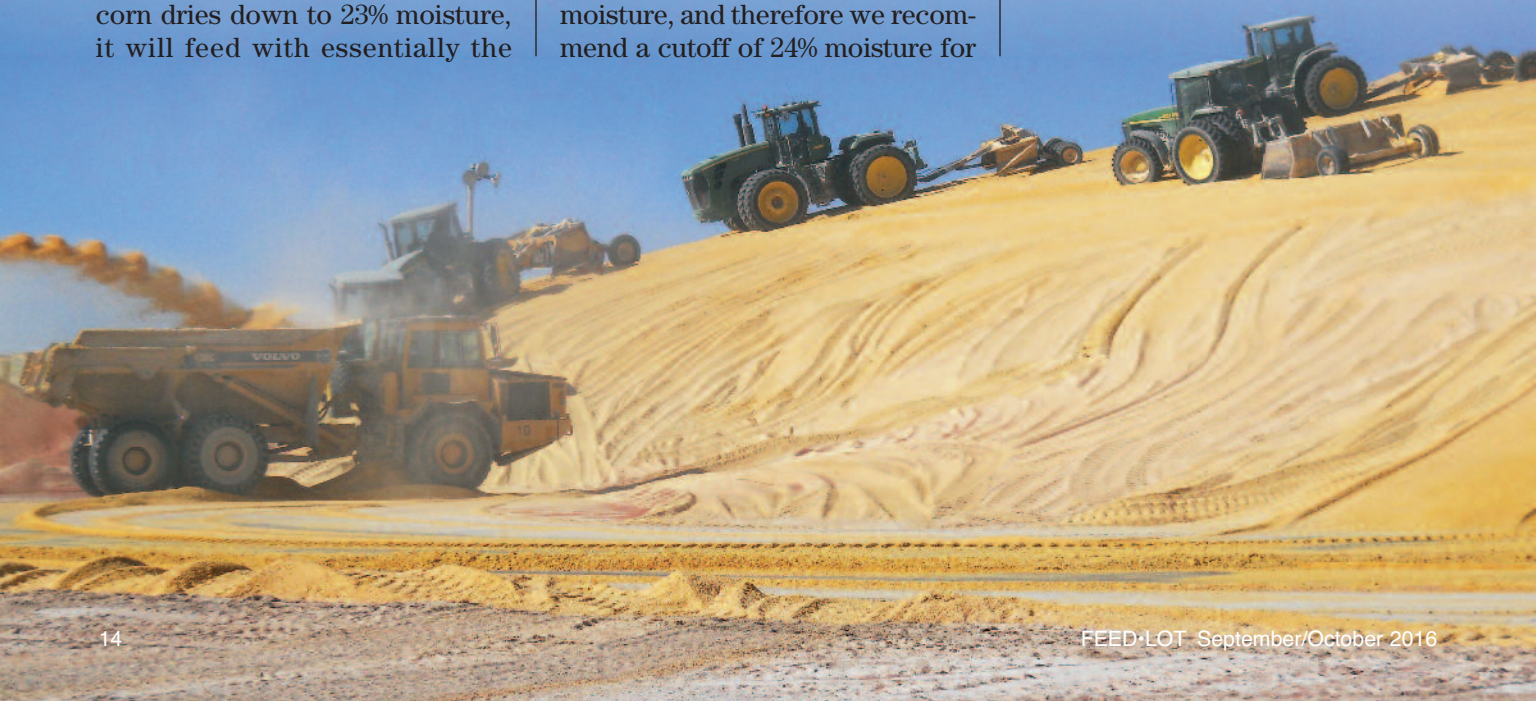
same energy as dry corn, but average energy value increases approximately 0.3% per point of moisture between 23 and 31%. Additionally, corn that is stored above 30% moisture becomes more digestible over time compared to corn stored at 24% moisture or less. In summary, ideal HMC harvest should start once black layer is achieved and be completed by the time corn has dried down to 28% moisture, resulting in an average moisture in the pile of 30-31%.

Almost every year, some corn is going to get harvested for HMC below 26% moisture. When you expect that to happen, your process should be adjusted to gain more value out of the drier corn. Our recommendation is to begin adding water when corn moisture drops below 27%, and focus on adding enough volume to bring the corn back to 30% moisture. In order to allow the corn to take in more moisture, it may be necessary to reduce the particle size of the grind. When corn drops below 23-24% moisture it is very difficult in most systems to reconstitute the corn to 30% moisture, and therefore we recommend a cutoff of 24% moisture for

corn that is to be ensiled.

Particle size is the next critical point of HMC management. The correct particle size is very feedlot dependent, and is influenced by infrastructure, bunk management, and other available feedstuffs. Infrastructure is important, as it can limit the amount of HMC a feedlot can process in the ideal moisture window, and because the type of equipment present determines the best way to process corn. The ideal particle size at an operation will strike a balance between harvest efficiency, energy density, and the risk of digestive disturbances.

Feedlots that grind HMC with a hammer mill (tub grinder) generally create a finer grind that packs tighter, but ferments more quickly in the rumen resulting in greater risk of acidosis and bloat. Dry matter conversion of cattle fed hammermilled HMC is usually better than those fed roller-milled HMC but dry matter intake and gain are usually lower. Monitoring particle size is important, with an achievable goal being no more than 3-4%



whole kernels and not more than 20% fines (<1mm). Commercially available sieve shakers work well for determining particle size distribution, and should be used at least twice daily to determine if adjustments are needed.

Roller-milled HMC creates fewer fines, which result in lower risk of digestive deads along with increased dry matter intake and gain compared with hammermilled corn. On the other hand, fewer fines mean roller-milled corn is more challenging to pack. Some manufacturers offer roller mills with differential drives on at least one set of rolls in order to create enough fine particles to assist in packing HMC. If milling HMC with a roller mill, strive for essentially no whole kernels and you should still be able to keep fines (<1mm) under 10%. In a perfect world, each kernel would be split into roughly 6 equal pieces. However, corn

processed in such a manner does take more time to pack, so there is a time-saving advantage to creating more fines.

After moisture and processing, correctly packing HMC is next on the list. In general, adequate packing requires a pack tractor for each 4-5,000 bushels per hour of grinding capacity. Pack tractors should not be sitting between loads, but constantly on the move. There is a fallacy that pushing corn up is enough during the day if you pack it well at the end of the day. The truth is, only the uppermost six inches of corn in the pile gets packed, so each load should be packed as it comes in. A well-packed HMC bunker will contain at least 45 lb of dry matter per cubic foot. Once packed, HMC should be covered immediately after completion of the pile to achieve the highest quality.

Another consideration for HMC production includes inoculants,

which is a decision you should make in conjunction with your nutritionist, based on the cost of inoculation relative to the value of corn – and your ability to correctly apply inoculant. Also try to feed at least 6" off the face of the pile daily and maintain a vertical, flat face with no loose corn at the base of the pile to minimize shrink during feedout.

With some planning and quality control, and some help from Mother Nature, you can put up a tremendous volume of HMC in a short period of time. Because the process needs to occur quickly, it is tempting to rush through processing and not focus on quality. This year, take the time to manage the process for a short period of time so you can enjoy the results throughout the rest of the year.

For more information about this and other nutrition topics, visit Great Plains Livestock Consulting at www.gplc-inc.com

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In cattle, rare instances of anaphylactic-like reactions, some of which have been fatal, have been reported, primarily following intravenous use of flunixin meglumine.

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May 2009

US 3449 JV

BY DAN LOY, IOWA BEEF CENTER DIRECTOR

Thinking About Retaining Ownership in a Custom Feedlot?



While cattle feeding can be a narrow margin business, retained ownership of spring born calves through the feedlot historically has added value and improved profitability. Recent record feeder cattle prices and cattle feeding losses may be an exception.

A 2005 summary of retained ownership by John Lawrence showed that on the average net returns for the 19-year period were improved \$51 per head by placing spring born calves into the feedlot at weaning and marketing them as fed cattle. At this writing crush margins suggest that opportunities may exist through risk management to protect some profit for calves (www2.econ.iastate.edu/margins/cattlecrush.htm). Retained ownership offers cow-calf producers the ability to capture the value of selection programs for performance and carcass traits, and now also for feed efficiency.

For the cow-calf producer considering custom feeding calves, here are a few considerations from a customer's perspective.

Yardage is the daily non-feed cost charged by the feedlot. Unless feed or other charges are marked up, it also should include the profit margin for the feedlot. There is tendency for some custom feedlot customers to shop for feedlots on the basis of the daily yardage

charge. This can be a mistake. Yardage may not include certain costs such as bedding, medicines, chute charges and other items. Also, environmental protections and other factors that add to yardage charges may reduce the cost of gain. Feedlots that mark up their feed, either directly or indirectly can charge daily yardage charges at less than their actual costs. The best comparison of one custom feedlot to another is the final cost of gain, the value of the fed cattle at market and the services provided by the feedlot that may be important to a client.

Services that may be important to a retained ownership client include smaller pens for less than full load lots, and the ability to split or share ownership of a pen. Financing or partnering may also be important to some customers. Feedback such as individual cattle growth and carcass data is an important service to some cow-calf producers who are working on herd improvement. Other services such as grain banking can be important for clients that are looking to market their corn through cattle. Custom feedlots in Iowa provide a range of services and some may excel or specialize in some areas. The custom feedlot client should evaluate what is important to them and find the yard that meets their needs.

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USING LAYERS OF DATA

When GPS data collection became popular in grain production several years ago, we began to hear the term “layers of data” used to describe the abundance of information that needed to be analyzed to make the best agronomic decisions for any given field. Those layers include soil type, yield history, fertilization records, hybrids, weed control, pest control, etc.—all data that helps to maximize the production of the field. These layers are often depicted graphically as different transparent sheets, stacked on top of each other, creating one image that combines all this data revealing the best way to maximize yield.

In some ways, we can use the

same layers of data in cattle production. We might consider nutrition, genetics, weather, bunk space, water availability, vaccinations, implants, treatment protocols, and a host of other inputs as these layers.

We can take the same approach with people. There are layers of data available for us to use to maximize this resource as well. Those layers might include character, core values, work experience, education level, work ethic, personality, emotional maturity, birth order, technical skills, attitude, passion, motivation, etc. All these layers can be analyzed and included in a broad assessment of an

individual's potential.

This information is collected from the first time that we meet the individual and every day thereafter. It is gleaned from day-to-day interactions, working side-by-side with them, reviewing their daily performance, quarterly and annual reviews, their team's performance, quality of their work, capacity for extra work, flexibility, daily attitude, etc.

Collecting this data on each individual also includes personal conversations and getting to know them at a deeper level than a basic employer/employee relationship. We may have to ask them directly about what motivates them, the

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things they are passionate about, what they would like to learn more about, their plans for the future, etc. Another source for this information is what their coworkers know about them. We want to be certain to maintain appropriate confidentiality in this regard and not ask coworkers to share intimate information about their friends at work. This can lead to a loss of trust and a sense of betrayal that may take a long time to overcome.

Like any other data collection we have to remember the adage “garbage in/garbage out” so be certain that your own personal biases and preferences do not cloud your assessment. Many great employees have been chased away by a sense from their employer that they weren’t liked or appreciated. Use multiple observations over several situations before coming to a conclusion, and even then you must continue to observe behavior until you know that your information is accurate.

So, now that you have all this information, how do you use it? Here are a few suggestions:

- Assigning tasks—be sure that you are using their strongest and most valuable traits. This increases their satisfaction and maximizes overall productivity.
- Forming teams—some people just get along better with certain types of individuals. Don’t force behavioral opposites to work together if you have alternatives. The greater the cohesiveness of your teams, the greater their production.
- Coaching—as you provide direction and guidance to your employees both short and long-term, use specific information that you have gleaned to provide detailed advice. Look for specific areas of additional training that motivates them and builds their value. Consider challenging their abilities with new responsibilities that fit their strengths. You may even reveal to them strengths that they did not know they possessed.

- Reassigning positions—there are times when a change in responsibilities can enhance growth, stimulate passion and develop self-confidence. Look for ways to use your knowledge of each individual to maximize their potential and the operation’s output.

There are many applications to the concept of using layers of data to enhance productivity. Your

business has potential that can only be harnessed by capturing all the talents that your people possess, and leading them in a manner that inspires them to reach their maximum proficiency.

For assistance with these and other employee management issues, or to invite Don to speak about any of these topics, contact him at 765-523-3259 or e-mail: don@dontyler.com

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5 Ways to Reduce Stress in Your Receiving Protocol

Is your receiving protocol causing stress, or is it seamlessly transitioning your calves and setting them up for future success? The difference between a stressful and a seamless receiving period can have a significant impact on future performance.

"How we receive calves at the feedlot can affect performance throughout the feeding phase," says Chad Zehnder, Ph.D. and cattle consultant for Purina Animal Nutrition. "The ultimate goal is to get cattle on feed quickly and keep them healthy so that they gain weight efficiently during the receiving period and throughout the rest of their time on feed."

These five tips can help reduce stress in your protocol:

1. Be prepared

"Have a plan in place for vaccinations, health protocols and feeding programs to help calves hit the ground running," says Zehnder. "The more information you have on incoming calves, the easier it is to make health and nutrition decisions."

Which vaccines, if any, have calves received? Have they been dewormed or castrated? What type of feed are they used to? Knowing these answers before cattle arrive can help you create a more strategic plan for processing.

A separate plan for preconditioned and newly weaned calves is also beneficial to maximize your receiving program. With a "one size fits all" approach, you might be investing unnecessary resources on preconditioned cattle and under prioritizing high-risk, newly weaned cattle.

2. Reduce stress upon arrival

Transitioning calves from their herd of origin to the feedlot can be highly stressful for them, especially for those freshly weaned. Understand the stress levels of incoming

calves and set aside downtime before processing to help make the transition easier for them.

Calves that have traveled long distances may be dehydrated and tired from hours of standing when they arrive at the feedlot. To reduce stress before processing, it's a good rule of thumb to allow one hour of rest for every hour spent in transport.

Access to a clean, dry environment will also minimize stress and make calves feel at home.

"Proper pen conditions with access to shelter, feed and water are essential to help cattle feel comfortable when arriving at the feedlot," says Zehnder.

3. Avoid the yo-yo effect

Monitoring feed intake and bunks is important to avoid what Zehnder calls the "yo-yo effect."

"As calves pick up intake after arrival, we tend to increase feed significantly. We try to get calves to eat more at too quick a pace," explains Zehnder. "Usually, this leads to calves crashing and going off feed again."

"This cycle can follow calves throughout the whole feeding phase. It's important to be consistent and methodical on any deliveries and increases of feed," he adds.

A good rule of thumb is to increase the amount of dry matter by one pound every two to three days. For yearlings and preconditioned calves, this process can take 7 to 10 days whereas freshly weaned calves can take 28 to 30 days.

4. Focus on fresh feed and feed type

"If calves leave feed in the bunk, they will typically not clean that feed up," says Zehnder. "It's likely spoiled and you need to clear that out and deliver fresh feed."

The feed delivered is also important. Look for a starter supplement that has appropriate trace mineral



fortification, the correct protein makeup and proper feed additives that may help calves stay healthy through respiratory and health challenges.

When delivering a total mixed ration (TMR), it's important to make sure the diet can't be sorted. A diet that minimizes sorting results in nutrition that is consistent with every mouthful of feed. If feedstuffs are inadequate or unavailable to make a palatable starter diet, another option is to use a complete feed that can provide consistency and palatability.

5. Don't forget water

The importance of water shouldn't be overlooked. Staying hydrated can be a challenge for newly weaned cattle that are not used to automatic waterers.

"Calves will naturally walk the fence line when introduced to a new pen. Placing additional water troughs perpendicular to the fence will help maximize their exposure to water," says Zehnder. "This strategy can be especially helpful for high-risk calves."

Letting the water run over for a day or two can also be beneficial for cattle arriving at a feedlot. The sound of running water will help calves find water troughs more quickly. However, allowing water to run over can also result in poor pen conditions, so it's important to control where the water flows and make every effort to keep the space clean and dry.

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What Does EPA Say About Getting Rid of An Unnecessary CAFO Permit?

BY JOHN GEORGE, P.E.,
AG ENGINEERING ASSOCIATES

In the last issue of FEED-LOT, I discussed the lack of a process or procedure for canceling a CAFO permit. In that article, I mentioned I had not received an answer from the EPA, despite contacting them over three months ago.

Since I had not received a response, I reached out to a staff person in the Permits Branch of EPA in Washington. For brevity, I will paraphrase the response as follows:

"We conference regularly with all of our state counterparts so it would be surprising if they aren't familiar with the provision that only CAFOs that "discharge or plan to" need an NPDES Discharge Permit."

The response went on to say that:

"It would be surprising if there are CAFOs that are unaware of the changes in the rules due to the publicity and the dissemination of information by industry trade associations. Further, CAFOs claiming no discharge haven't been reapplying for coverage, and there has been a significant drop in the number of permitted facilities."

My EPA contact further advised that essentially "all of the permits in force when the Court Decision was rendered have since expired and all non-discharging facilities merely did not renew their permits."

EPA data on the number of CAFOs and Permits from 2011-2015 was provided. There were some obvious errors in the data, but adjusting for those, the number of permits on a national basis continues to increase. The three leading cattle feeding states are located on the High Plains, a relatively arid region with very flat terrain and limited drainage features that could readily carry feedlot runoff to waters of the U.S. Even so, at least one of the top three cattle feeding states is still shown with 100% of their CAFOs

Even so, at least one of the top three cattle feeding states is still shown with 100% of their CAFOs having federal permits.

having federal permits. Nearly one in five of the 50 states reflect that 100% of their CAFOs have a permit. Nearly two fifths of the 50 states still report over 90% of their CAFOs having a permit

EPA obviously feels there is no need for a broadly publicized process for eliminating unnecessary CAFO permits. Most of the state environmental agencies also appear focused on retaining all of the federal permits they can even without statutory basis to do so. Concurrently, most of the industry, in my experience and opinion, is still oblivious to the fact that their facilities may not require a federal permit.

So, EPA (with the complicity of the States) is not going to do anything to redress this long standing bureaucratic over-reach. Our industry is going to have to take the initiative if this is going to change!

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Cattle Feeder Index: Northern Cattle Feeder Info Needed

Cattle markets are volatile. If anyone had doubts of that, the past year should have made them believers. Not only are markets volatile, but the trend toward contract sales has left fewer cattle on the open market, making it harder to establish price. Now add to the mix financial advisors' advice to manage risk through hedging options.

The result is a scene most in the cattle business have seen many times: The slow removal of the hat. Generous head scratching combined with a quizzical look. Replacing the hat and walking away.

Translation: It's hard to make a sound investment without a clear predictor of market performance.

The CME Feeder Cattle Index is a tool that can help. Often overlooked, the Feeder Cattle Index provides investors with a reliable benchmark for market performance based on USDA Agricultural Marketing Service Feeder Cattle Reports. The information is publically accessible via the USDA website.

The Index is based on sample transactions from 12 major cattle-producing states: Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Wyoming. Cattle must be 650-849 pound (700-899 pounds beginning November 2016) Medium and Large Frame #1 or #1-2 feeder steers, have been sold via feeder cattle auction, direct trade, video sale, or internet sale transactions. The index is a seven-day weighted average of sales during the weekly

reporting period.

Transactions included in the USDA-AMS report, and hence the CME Index, are voluntary, and therein lies a problem.

"To make the Feeder Cattle Index more accurate, there needs to be an increase in the number of direct trade sales reported," says Justin Lumpkin, Officer in Charge at USDA-AMS Sioux Falls, South Dakota office. "Very few direct sales are reported." With heifers and cattle not meeting the Index specs not included, less than 5 percent of cattle placed on feed per month are included in the report.

To further complicate the picture, northern states are often underreported with only around 35-40 percent of index volume coming from the eight northernmost states: Colorado, Iowa, Missouri, Montana, North Dakota, Nebraska, South Dakota and Wyoming. Direct trade volume accounts for only 15-45 percent of total index volume, with northern states comprising only 10 percent of total direct trade volume.

USDA and CME data showing southern cattle often sold at a discount to northern cattle, combined with the higher volume from the southern states, lowers the average price of the Index. Therefore, the Index has a weighted average that more closely represents the south, making the Index lower than average cash prices in the north.

"We especially need more direct sales from the northern states reported," says Lumpkin. "That will help correct that issue."

Brad Kooima, cattle producer and commodities broker from Sioux Center, Iowa, agrees: "Our goal is to try to have a feeder cattle index price that more accurately represents what feeder cattle are worth in the north, so that it's not weighted so heavily for the south. That will lead to a more reliable feeder cattle futures market."

Cattle feeders incurring transactions of feeder cattle, buying or selling, can participate. Currently USDA-AMS Market News reporters contact feedlots, producers and order buyers to collect information. New contributors are welcome, but must participate for 30 days before any of their data is used in the report. Only regular contributors are included to ensure accuracy and consistency. Likewise, both the buyer and seller must be listed, allowing USDA to verify the transaction. Buyer and seller information is kept confidential, with only the volume and value information included in the report.

Required cattle transaction information needed to portray market activity includes grade, head count, base weight, price and delivery period. USDA Livestock, Poultry & Grain Market News reporters can help contributors with USDA livestock standards and grades when necessary.

Weekly direct trade information can be reported to the USDA via phone or email. Producers interested in participating should contact a USDA Market News Reporter at 405-232-5425. **FL**



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Hazards of Plastic and Net Wrap

Cattle, especially young ones, are curious and like to chew on anything within reach. They eat baling twines, plastic bags and other debris that ends up in their pen or pasture. The strange material may taste or smell interesting, so the animals chomp it down. Sometimes they accidentally ingest foreign objects in feed just because they eat hurriedly and don't bother

to chew very much the first time around. Every year a few cattle die mysteriously—often after a slow decline with loss of weight and diarrhea. The owner and veterinarian may be clueless about cause of death unless the animal is opened up to find the material plugging the GI tract.

To illustrate this, Colorado Springs Veterinarian Dr. Gary McIntyre was once called to a ranch to check a steer that was slowly wasting away with watery

diarrhea. The steer was a little bloated and wasn't eating much, but drank water. His temperature was normal, heart and lungs seemed fine, he didn't have hardware, and none of the fecal or blood tests that were taken showed any indication of disease. The steer finally died and Dr. McIntyre did a necropsy—and discovered denim pants plugging the rumen.

Ingestion of various material (usually plastic) has become a common killer because cattle have access to more litter. Pastures or pens may be next to a highway where litter from passing cars blows over the landscape, or near dumpsters, construction sites, or a subdivision's garbage that blows over the fields. Plastic bags, party balloons, weather balloons and other "fallout" from human activity may end up inside cattle, and there's no way to remove the blockage without surgery. Without knowing the problem, no one wants to do exploratory surgery on cattle. The result is a slow, painful way to die, with no definitive symptoms.

A small piece of material may go on through and you never know the animal ate it. If it's a large blockage, the animal may stop passing manure, and stop eating. Partial blockage leads to diarrhea, since only the liquid contents of the gut can make it through. The producer might suspect diseases like coccidiosis, Salmonella, BVD, E. coli, Johne's disease, liver flukes or other parasites, but there is no treatment for "plastic disease". Prevention requires picking up every piece of garbage you find in pastures, including old hay twines, and never re-baling broken bales without first removing the twines. ►

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Hazzards... from previous page

Net Wrap and Twines

Cattle producers are discovering dangers for cattle when leaving net wrap or twines on hay/straw bales when feeding, or using a bale processor to chop forage as it is being fed. Dustin McCullen has a cow-calf herd in Montana and tells of a cow losing weight, with diarrhea. She got to the point that he shot her as the humane thing to do, then had his veterinarian—Beth Blevins—do

a post-mortem examination.

“A few years ago we started noticing an occasional cow start wasting away, with little or no appetite. They went downhill fast once they started losing weight. We’d lose about 1 cow per year. We first noticed this about 5 years ago, after we bought a new baler that used net wrap on big round bales,” says Dustin.

“The cows lost weight quickly and we’d end up euthanizing them because we didn’t want them starving to death and getting down—too weak to stand. We couldn’t figure it out. Then we heard about one of our neighbors having troubles like this and taking one of his cows to a butcher—and finding the rumen full of net wrap. So when I had another cow losing weight last year we had our vet post her after I shot her. Sure enough, the rumen had a big wad of net wrap.”

Earlier, he suspected something like hardware. “We’d put magnets in these cows and give them antibiotics, but nothing helped. The cows were starving to death in spite of lots of feed available. The rumen was full—with the net wrap, impaired digestion and not much going through—so they couldn’t eat very much,” says Dustin.

“Symptoms were like John’s disease but we hadn’t bought any outside cattle. After we found the net wrap in that cow, we suspect that’s what was killing the other cows.” The wad of net wrap removed from the rumen was huge, and mixed/tangled amongst the hay in one big mess.

He often put straw bales in a round bale feeder, and to keep it from shattering and being wasted left the net wrap on. He’d come back the next day and take the net wrap out of the empty feeder. I think sometimes the cows got hold of that net wrap and ate it. And since it can’t get on into the small intestine it just stays in the rumen,” he says.

“This cow had a slight infection; there was pus in her small intestine where the net wrap was rubbing against the opening, irritating the tissue. She’d lost weight for a few weeks, and then started acting real sick—maybe because of the irritation and infection,” says Dustin.

“We asked Dr. Blevins if she’d ever seen any other cases. She said no, but she thought that most people don’t check. They might have a cow or two that just wastes away and they never know what the problem is. In our experience there

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Plastic net wrap pulled from the rumen of a cow.

was no reason for the weight loss; sometimes it might be a 4-year-old cow, or a 14-year-old cow. Symptoms are similar to Johne's (but young cows don't show symptoms with Johne's) and hardware disease, but after dragging that big

wad of net wrap out of this cow we are fairly certain that's what happened to the other cows," he says.

"When bales are frozen and we roll them out for the cows, it can be nearly impossible to get the net wrap off. We just leave it on the outside round and come get it later after the cows have eaten the hay. That's probably when we have the most trouble—when net wrap or twine is stuck to bales and you have to leave it on, or leave it on straw bales in the feeder. We do cut it off, if possible," says Dustin.

"We didn't seem to have as much trouble with twine. Perhaps it's possible for a piece of twine to go all the way through the cow, whereas the big wad of net wrap can't make it through." It might depend on how much twine, and whether it breaks apart.

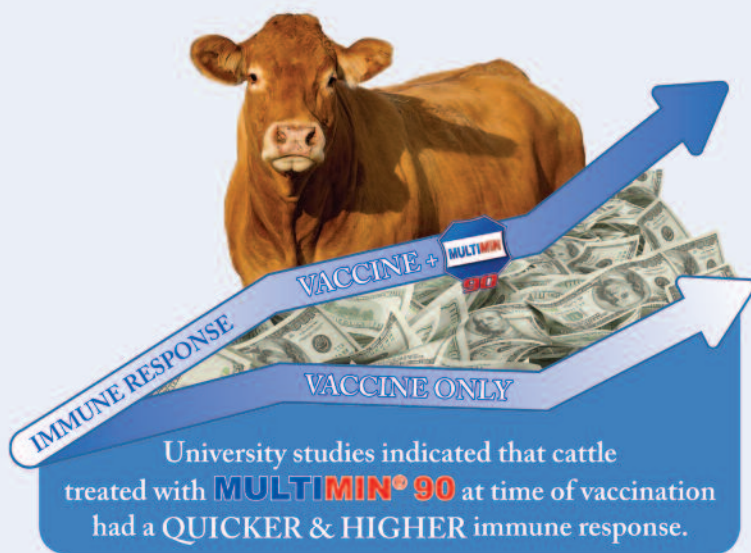
Beth Blevins, the veterinarian who did the necropsy, says cows may keep ingesting more pieces

and it gets all tangled together as a bigger wad, making it even harder to pass on through. Diagnosis is difficult in the living cow because the wad of net wrap would not be detectable with ultrasound. "It would look just like part of the rumen contents, mixed in with all the hay and feed," she says.

Plastic doesn't seem to break down in the rumen. "I don't know how long this wad was in her gut, but it looked just like fresh net wrap—except it had changed to a darker color and was no longer light green. It didn't break down at all. Also, I think when rumen material starts layering over the top of it, this would tend to protect it. The rumen has bacteria for fermentation digestion, but doesn't have the acid that's in the abomasum (true stomach). The acid might break it down, but the net wrap didn't make it to the stomach; it stayed in the rumen," says Blevins. **FL**

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FEEDING RFCs FOR HEALTHIER CALVES

Producers often look for ways to improve calf health so young animals can withstand challenges to their immune systems. One such way that is gaining in popularity in the dairy industry and is also applicable to beef cattle is the use of refined functional carbohydrates, says Dr. Jeff Weyers, Stephenville, Texas, Technical Service Manager, Arm & Hammer Animal Nutrition.

Refined functional carbohydrates (RFCs) can help establish a healthy foundation for calves. “These are part of yeast cell walls harvested from a yeast called *S. cerevisiae*, using certain enzymes. This yields mannan oligosaccharides (MOS), beta glucans and D-Mannose,” says Weyers. These are some of the ingredients in supplements called pre-biotics, which in essence feed the probiotics—which are live bac-

teria that are normal inhabitants of the GI tract and needed for proper gut function. Several companies now market products containing prebiotics and probiotics.

MOS works in the small intestine against *E. coli*, *Salmonella*, *Klebsiella* and other nasty pathogens that can cause diarrhea and digestive issues. MOS is the prebiotic part of the RFC that provides food for beneficial bacteria, Weyers says. The beneficial bacteria must be able to outcompete the pathogens. The gut needs an adequate, healthy population of “good bugs” in residence, leaving less room for the “bad bugs” to come in and cause harm.

“Arm & Hammer makes an RFC product (from yeast) that includes MOS. We also utilize another enzyme that cleaves off the individual

mannose sugar,” he says. This sugar is very beneficial in the gut because it binds to the pili (fingerlike projections) of *E. coli* and *Salmonella* and prevents pathogens from attaching to the intestinal lining. The pathogens then pass harmlessly out through the tract to be excreted.

“These pathogens want to attach to the small intestine, seeking out the mannose sugars that normally occur in the intestinal wall. This is how they bind to the wall and start their pathogenic activity and destruction of the lining. The mannos sugar from the RFC product is available in the gut, attracting the pathogens to attach to it instead of binding to the mannose in the gut wall.” The free mannose is like bait, keeping pathogens from attaching to the gut.

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Feeding RFCs... from previous page

RFC product is beta glucans. There are two different kinds of beta glucans. One is derived from cellulose and the other from the yeast cell wall. The beta glucan liberated from the yeast cell wall has been proven to bind mycotoxins (which sometimes occur in feed), and also stimulate the immune system to get into a ready state. There has been a lot of research on this in human medicine, in cancer research. There is a human supplement containing beta glucans. The immune side of this is now the focus of research in many companies, looking at the benefits for cattle, poultry and swine," says Weyers.

An additional component in some RFC products is another refined functional carbohydrate that binds *Cryptosporidium parvum* which is another pathogen (protozoa rather than bacteria) that baby calves sometimes have to deal

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with. RFCs make the calves less vulnerable to gut damage from Cryptosporidiosis.

Some products contain a full dose of yeast culture as well as the RFCs. "Calves that receive this combination not only gain immune enhancement with the RFCs, but also a more efficient use of feed, and thus more efficient production and a healthier gut. It binds pathogens, mycotoxins, etc. and has been very effective in calves that have a compromised immune system," he says.

"These products are helpful for calves and are also being used in adult cattle and other species. They are especially useful for calves with scours or some other kind of gut issue. It's not a cure-all but is very effective against most pathogens that damage the gut." It can be helpful in supportive treatment, along with fluids, electrolytes, etc.

Various RFC supplements for calves come in liquid form, a soluble-concentrated powder (SPC) and a carrier form. "You can put the liquid into milk or milk replacer, or give it as a drench (such as with a dose syringe). If you are treating a calf with severe scours, some product labels suggest giving 2 to 3 times the recommended dose (to try to give that calf a jump start on fighting the pathogens)," says Weyers. Some products are geared for growing and finishing cattle and come in different forms.

Multiple peer-reviewed research trials have proven the efficacy of RFCs. Some of the research was done at Texas Tech, in New York (at Spruce Haven Farms), and in Canada. Research is ongoing in many places to uncover more of the benefits of RFCs.

"At this point the dairy industry is the main market for these products, but cow-calf producers and feedlot receiving yards are starting to look at this — as another tool in helping keep cattle healthy." Research has shown that calves fed

RFCs recover faster than calves that don't receive RFCs. Healthier calves grow better, not having to expend energy fighting infections. Research studies have shown that RFCs can significantly improve

health and performance (weight gain), compared to calves in control groups that received no RFCs. Jump-starting the immune system with these products definitely benefits the calves. **FL**

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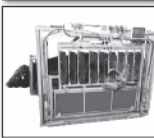
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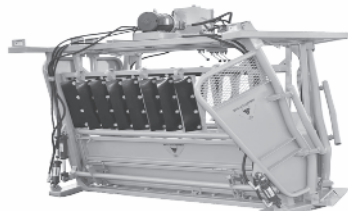
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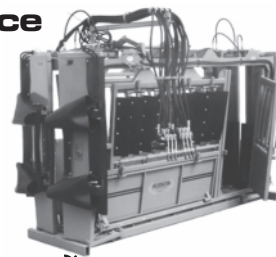


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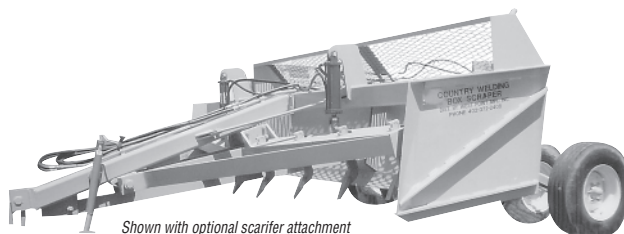


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