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The Great Plains News Feed

Great Plains Livestock Consulting, Inc.
"Turning Science into Money"

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March/April 2011

The Latest Across the Plains

Update 2011 Title 130 Regulation for Nebraska Feedlots

The Environment Quality Council has approved draft changes made to Title 130, and it is now awaiting final approval from the Attorney General's office, once approved it will be effective within five days. This will affect operations that are making considerable changes or proposing new facilities immediately. All others who hold a NPDES and have no plans to change will have to comply with new regulations beginning at their next permit cycle which will be after April 1, 2013.

NMP changes have different public notice requirements. If there is a substantial change it will require a public notice with the possibility for a hearing request. If there is a non-substantial change then the only requirement is that it be available on the NDEQ website for 7-10 days.

All sizes of operations, small & medium AFO's and large CAFO's, will be impacted by the manure managing aspect. If the manure is stockpiled in a field then the below information will apply to you.

Chapter 11, 006 Stockpiles of livestock waste shall be located to prevent a discharge to waters of the state. Stockpiles shall be managed as necessary by use of cover material, diking, or other means to prevent discharge until the material is utilized.

There will also be changes in the requirements of annual reporting. Along with the regular requirements the following have been added:

9. Any Changes made to the nutrient managing plan during the previous calendar year, including at a minimum, any changes in land application areas, methods of soil sampling, should include all supporting documentation. Changes in methods of land application and other major modifications require a new application and approval prior to the change.

10. The actual crop(s) planted and actual yield(s) for each field, the actual nitrogen and phosphorus content of the manure, litter, and process wastewater, the results of calculations conducted in accordance with a linear or narrative rate of application as described in Chapter 14, Section 003 of this Title, and the amount of manure, litter and process of wastewater applied to each field during the previous 12 months; and for any CAFO that implements a nutrient management plan that addresses rates of application in accordance with the narrative rate approach, the results of any soil testing for nitrogen and phosphorus taken during the preceding 12 months, the data used in calculations conducted in accordance with the nutrient management plan, and the amount of any supplemental fertilizer applied during the previous 12 months.

There will also be new regulations on the narrative and linear nutrient management plans. If any of these new regulations apply to you, be sure you know what they are and how they affect you. If you have any questions feel free to contact your nutritionist.

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Calendar of Events

- **March 9-11** Western Dairy Management Conference, Reno, NV.
- **March 11-21** Oklahoma Youth Expo, Oklahoma City, OK.
- **March 14-16** Midwest ASAS/ADSA, Des Moines, IA.
- **March 15-17** Midwest Poultry Convention, St. Paul, MN.
- **March 21-23** 60th Western Poultry Disease Conference, Sacramento, CA.
- **April 11-14** 2011 NIAA Annual Conference, San Antonio, TX.
- **April 13-16** AMI Worldwide Expo, Chicago, IL.
- **April 18-20** Tri-State Dairy Nutrition Conference, Ft. Wayne, IN.
- **June 28** 3rd Annual Cattlemen's College, Newton, IA.
- **June 29** 3rd Annual Cattlemen's College, Norfolk,NE.
- **June 30** 3rd Annual Cattlemen's College, Lyons, KS.

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Timely Reminders

General

- ✓ Corn is too expensive to feed to parasites, worm your livestock.

Beef

- ✓ Scrape snow from pens and keep aprons and approaches smooth.
- ✓ Place cows on a High-Mag mineral.
- ✓ Be ready to put up shades in the pens.
- ✓ Target a BCS of 5-5.5 on mature cows and 5.5-6.0 on heifers at calving.
- ✓ Be sure to adjust cow nutrition to match requirements as they calve.
- ✓ Decide which implant you will use on calves.
- ✓ Semen check bulls.
- ✓ Haul as much manure as possible out of pens.

Swine

- ✓ Make plans for summer marketing; 70-75% of yearly profits are made in summer months.
- ✓ Check fat levels in diets or plan when to use fat in diets for summer.

Unused Feed

- ✓ Nature gave us all something to fall back on, and sooner or later we all land flat on it.

BCS Calving Difficulty

By Dr. Dan Larson, Ruminant Nutritionist

As we approach and enter the calving season, many of us should be concerned with the body condition (BCS) of our heifers and young cows. Research has demonstrated that mature cows in a BCS of 4 or less at calving require 80 days to resume cycling after calving, whereas cows in a BCS of 5 or 6 at calving require 55 days to resume cycling (Houghton, 1990). First calf heifers likely require an additional 0.5 to 1 BCS at calving to achieve the same results. One misperception preventing producers from improving BCS is that a modest increase in nutrition will increase calving difficulty. It is important to keep in mind the difference between a modest increase and an overabundance of protein and/or energy.

A modest increase in energy will lead to an increase in BCS without affecting calving ease. Research conducted by L.R. Corah (1975) revealed that a 35% increase in energy in the last 100 days before calving resulted in a 4 lb increase in calf birth weight with no difference in calving difficulty. Similarly, Bellows and Short (1978) demonstrated that a 90% increase in total digestible nutrient for 100 days prior to calving only increased birth weight by 4 lb. Even this tremendous increase in energy resulted in a negligible (4%) increase in calving difficulty. However, pregnancy rates during the subsequent breeding season were improved by 15% or more in each study.

Improving protein status of pregnant females can also improve BCS. A study by R.V. Anthony (1986) fed diets that provided 80% or 140% of crude protein requirements (60% increase). The greater crude protein diet increased BCS from 5.4 to 6.1. Yet, calf birth weight was only increased by 2 lb and there was no difference in calving difficulty.

One of the clearest representations of the affect of BCS on birth weight and calving difficulty is a series of experiments conducted by Wettemann and others in 1986. These researchers fed heifers to achieve a BCS of 4, 5 or 6 at calving. Each successive increase in BCS increased calf birth weights a modest 2-3 lb. More importantly, calving difficulty was not affected by BCS. However, each increase in BCS resulted in at least a 10% improvement in pregnancy rate in the following breeding season. Clearly, improving precalving BCS is integral to rebreeding success.

Additional benefits of improving nutrition prior to calving include improved colostrum quality, increased calf survivability, increased weaning weight, improved steer calf quality grade, and an improvement in heifer calf reproductive performance. The benefits of improved nutrition are too important to ignore. Research has clearly proven a modest increase in nutrition does not increase calving difficulty. It is also important to note that virtually all research indicates mature cows are even less susceptible to nutritionally-induced calving difficulty. Consult with your nutritionist to develop a program that will improve your reproductive efficiency and cowherd performance.

Energy Values of Feeds– Interpreting a Lab Analysis

By Dr. Ki Fanning, Ruminant Nutritionist

Most producers have received a lab analysis of their feedstuffs including moisture, protein, minerals, and net energy (NE). The lab-reported energy values, are derived from equations, NOT true chemical analyses like protein and minerals are. These prediction equations are cheaper and faster than using metabolic trials. Using animals are more accurate but in order to determine the net energy of a feed, feces, urine, gas, and heat have to be collected and their energy measured, then subtracted from the total energy consumed. This can be done with live animals in a metabolic trial. The difference between total energy consumed and the energy that is wasted is the retained energy, or net energy (NE), which the animal puts into body growth, milk, and tissue maintenance, (NRC, 1996).

R. L. Belyea et. al., from the University of Missouri points out that energy content is often estimated from acid detergent fiber (ADF) content. Energy can be expressed as total digestible nutrients (TDN), digestible energy (DE), metabolizable energy (ME), net energy of lactation (NE_L), net energy of maintenance (NE_M) or net energy of gain (NE_G). J. W. Schroeder, from North Dakota State University states that as the percentage of ADF in the feed increases, the net energy value decreases. Laboratories are not required to use the same standardized formulas. This makes comparisons between laboratories difficult. Laboratories should be able to provide the source and accuracy of the formulas they use. The following are some of the many equations derived to calculate each of the energy values needed to formulate beef, dairy and sheep diets (J. W. Schroeder of NDSU, May 1994):

First, TDN has to be calculated

Alfalfa:% TDN=96.35--(ADF %x1.15)

Corn Silage:% TDN=87.84--(ADF %x0.70)

Next, $NE_{(L,\ M,\ G)}$ can be calculated using the above TDN equations.

NE_L: Mcal/lb = (TDN % x 0.01114) – 0.054

NE_M: Mcal/lb = (TDN % x 0.01318) – 0.132

NE_G: Mcal/lb = (TDN % x 0.01318) – 0.459

An alternative to energy equations or metabolic trials is a feeding trial where a control group of cattle is fed a diet of known energy content. The control group of cattle is then compared to a treatment group, which is fed nearly the same diet except the feed in question is added to the diet. For example, a finishing diet of corn and alfalfa hay (control diet) was compared to corn and alfalfa hay with wet distillers grains (WDG) replacing 30% of the corn on a dry basis. The cattle consuming the diet including WDG gained and converted better than the control group; therefore energy content of WDG obviously has more energy than corn and can be accurately calculated. The University of Nebraska has an extensive set of trials comparing different levels of wet gluten feed (WGF), dried distillers grains (DDG), modified wet distillers grains (mWDG), and wet distillers grains (WDG) in this manner.

This type of research has been done comparing increasing levels of WDG inclusion at 0, 10, 20, 30, 40, and 50% of the diet on a dry basis. Charts 1 and 2 are compilations of numerous studies conducted by Drs. G. Erickson and T. Klopfenstein and colleagues. Each point for gain or feed conversion represents the performance of a pen of cattle randomly assigned to receive one of the six levels of WDG. The line is the trendline for performance from the pen data. From chart 1, we can see that cattle fed 30% WDG, replacing corn, had the greatest ADG. Chart 2 shows that feed efficiency improves as the level of WDG increases, up to 40% of diet dry matter. Using this information, we can generate regression equations to calculate the NE_G of WDG.

Chart 1. Average Daily Gain

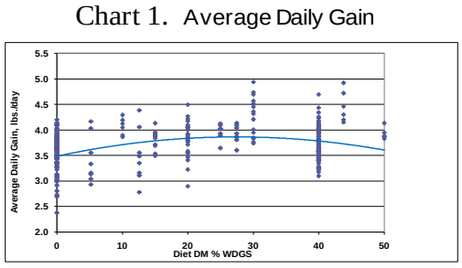
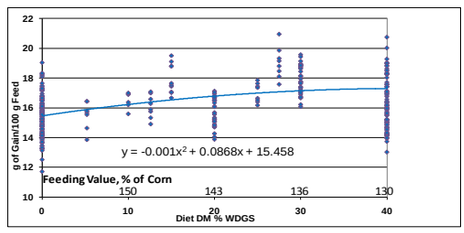


Chart 2. WDGS Feed Efficiency



The last area I want to discuss is NE_M vs. NE_G. Maintenance energy is that which is used to maintain the animal's body mass (tissue). Any remaining energy is then partitioned to NE_G or NE_L. In most cases, intake is positively correlated to gain and conversion. Maintenance energy is related to internal organ size, physiological state, genetics, weather, and other factors. Limit-feeding cattle can reduce internal organ mass, thereby reducing NE_M requirements and leaving more energy available for gain.

A major cause of increased NE_M requirements is the amount of mud that an animal walks through, as shown in Table 1. Mud does two things; 1) it costs energy to walk through and 2) it discourages the animal from approaching the bunk (remember; the more an animal consumes, the more they gain and better they convert).

Table 1. Potential Loss Caused By Mud at 21° to 39°F

Mud Depth	Loss of Gain
Dewclaw	7%
Shin	14%
Below Hock	21%
Hock	38%
Belly	35%

University of Nebraska, Animal Science Department.

This winter has been harsh, so Table 2 is very important. It shows that cold stress does increase the NE_M requirement; however, hock deep mud has the same effect as -10°F temperatures. We cannot do anything about temperature, but we can keep the pens scraped and well shaped, as well as remove snow and provide wind protection and bedding. If we strive to limit the amount of mud on hair coats of cattle, they will conserve body heat and NE_m requirements will not be as greatly elevated.

Table 2. Cold Stress in Cattle

Effective Temp (°F)	Extra Energy Required (%)	Extra Hay or Grain Required	
		extra hay (lb/cow/day)	extra grain [1] (lb/cow/day)
30	0%	0	0
10	20%	4.0	2.2
-10	40%	8.0	5.0

1. Cows may not be able to eat the amount of extra hay required to maintain their body weight and may have to be fed the indicated amount of grain instead of additional hay to meet their energy requirements.
(B. Tarr, Ontario Ministry of Agriculture, Food, and Rural Affairs)

In conclusion, energy values are not equal from lab to lab. The most accurate energy values are derived from feeding trials because the animal's performance is used to determine net energy instead of a fiber value. **Wet distillers and wet gluten have a greater energy value than corn in feeding trials. However, most laboratory analyses do not reveal this fact.** Increasing mud and lower temperatures increase the NE_M requirement and leave less energy available for gain. We cannot do anything about temperature but by maintaining good pen conditions, we can reduce the mud effect and aid the cattle in dealing with cold stress. Please do not hesitate to call or email any of us with questions, there is a lot of misinformation circulating about energy values - specifically those of by-product feeds.