Dear Ranch Hand Subscribers,

Welcome to 2012. ’Tis the season at the NDSU beef unit: Our first calf was born just before New Year’s Eve, but the majority of our artificial insemination-bred cattle are calving now.

I actually heard the statement, “I think I’ll move the cows out to cornstalks after Christmas,” from one of our producers. Although not something we normally would hear in North Dakota, it is certainly possible this year. As I write this letter, a familiar chill is in the air and the old task of thawing frozen waterers is at hand for many producers this morning! Yes, we may indeed have some type of, albeit short, winter. Most of our cattlemen calve later in the year and are thankful for warmer weather. However, if you are starting calving soon, I wish you the best of luck, patience and diligence during the calving season.

With many cows still out on pasture this year, I’ve included an article about the importance of supplemental nutrition during the later stages of gestation. Our Research Corner article also focuses on the topic of maternal nutrition but describes a project evaluating the effects of inadequate early to midgestation nutrition.

A major effort is being made by beef industry stakeholders to evaluate future plans of North Dakota beef producers and determine appropriate efforts needed to help the industry move forward. One in four producers will receive this survey in the mail, and we ask everyone who receives the survey to provide input for us. Your opinions are vital to shed some light on where our producers feel the industry is headed.

An additional article talks about self-feeding options for producers who want to finish cattle but want an alternative to daily feed deliveries.

For additional questions on the material covered in this newsletter or any other concerns on your operation, contact your county, area or state Extension personnel. We look forward to serving you!

Sincerely,

Carl Dahlen, Ph.D., Editor
NDSU Extension Beef Cattle Specialist
A summer of excessive moisture and good grass growth followed by record high temperatures and record low precipitation this winter has provided many northern Plains cattle producers with the opportunity to extend their grazing season well beyond normal.

Although producers currently grazing are most likely saving money by not dipping into harvested or purchased hay reserves, cow stage of gestation and coincident nutrient requirements must be considered to determine whether cows are getting the nutrients they need from midwinter grasses. These cows’ nutrient requirements are changing as the animals progress into the third trimester of pregnancy. Depending on their calving season, many of the cattle on pastures are experiencing this requirement increase.

However, the protein of forages standing at this point is very low (probably no more than 4 to 5 percent). Cows during the third trimester should be eating feed with around 8 percent protein.

In addition to protein percentage, producers need to keep in mind the physical form of the standing forages. As we progress into winter, the pasture grasses are more susceptible to being knocked over by cattle or weighted down by snow and wind. Add this to the fact that winter grasses are less palatable compared with earlier in the year, and it becomes difficult for cattle to consume the amount of forage they need.

The mineral and vitamin content of standing forages likely is below requirements as well. Minerals at this stage largely are needed to develop a calf’s immune system both through nutrients circulating through the cow and from nutrients that will be available for colostrum and milk production once the calf is born. Not having proper minerals now could be a big issue for calf health in a few months.

Not meeting cattle’s nutrient requirements also can affect fetal programming, although the impact is not necessarily seen immediately. Rick Funston, Extension beef reproductive physiologist at the University of Nebraska-Lincoln, has conducted considerable research on the impact of protein supplementation during late gestation on the health and performance of the offspring. Funston found that calves born from cows that were fed supplements during late gestation had better growth rates, a greater percentage of heifers became pregnant during their first breeding season, and calves put into feedlots had greater feedlot performance.

We’re talking lifetime productivity, and it is not something that can be seen in the cows today but can have big impacts on herds into the future. Producers who have cattle in late gestation should provide their cattle with some type of protein and energy supplementation, such as lick tubes, range cubes or distillers grains. Free-choice alfalfa hay delivered to cows in addition to grazing also will provide additional protein.

Monitor body condition very closely and ensure the proper delivery of vitamin/mineral supplements to cows. Pre-calving losses in body condition set cows up for issues after calving. Metabolic conditions, retained placenta and delayed rebreeding are things that I would be concerned with if cows came through the summer on great grass but then lost a lot of condition just prior to calving.
Self-feeding Options

John Dhuyvetter, NDSU Extension Area Livestock Specialist
North Central Research Extension Center

Most cattle feeding is designed around daily or twice-daily deliveries of feed to meet the expected needs of the cattle being fed.

The preferred method is to provide a mixed ration of feedstuffs that is readily consumed and meets projected nutrient needs for production and health. This allows for efficient use of feed, control of waste, and the ability to include a wide range of feed ingredients and adjust rations according to animal response and changing conditions.

The investment in feeding equipment may be very minimal for small numbers of cattle being hand-fed by placing feed in bunks with a bucket and fork. However, the investment may be too substantial for some producers if large numbers are being fed with the use of mechanization, including loaders and feed-mixing wagons delivering feed to fence-line bunks.

With limitations on available labor, time or buying power, some situations lend themselves to alternatives in which animals self-feed for a portion or all of their ration from a multiday supply of feed.

Intake-limited, self-fed supplements are popular for grazing and range cattle for the convenience and savings from less delivery costs. Where small quantities of supplemental feed are needed, such as with minerals or protein, commercial products have been developed in the form of liquid feeds, pressed blocks, low-moisture tubs and loose meals, and hardness, flavors, placement and/or restricted access have been used to limit consumption.

Hay also is commonly self-fed. Large-bale packages feed a group of cattle for multiple days. Waste is controlled by placing bales in feeders to restrict trampling and bedding losses. The concept of “grazing” a multiday supply of bales in the “field” is being looked at by people wanting to limit daily feeding costs and labor.

The amount of hay provided for the number of head for a certain period of days needs to be estimated fairly closely to avoid excessive waste. Feeding a mix of higher- and lower-quality hay also limits waste in fairly low-value forage, and when hay is fed in the field or pasture, it may not require added cleanup expense, and it contributes organic matter and fertility to the land.

Creep feeds also typically are self-fed to nursing calves in feeders with cages to restrict access to cows. In some instances, additives may be used to limit calf consumption and protect against digestive problems caused by overeating. Formulations of creep feed also tend to use feed stuffs high in digestible fiber and minimally processed or pelleted to prevent bloat-causing fines from being prevalent in the ration. The inclusion of medications such as an ionophore further helps modulate intake, modify rumen fermentation and lessen digestive risks.

Creep feeders/self-feeders also can be used to feed growing finishing cattle postweaning and are a convenient option for smaller groups. Generally, daily mixed ration-fed cattle achieve slightly better performance and better conversion with greater control or management of digestive health.

Not all feeds that can be fed safely in a bunk work well when self-fed. Typically, minimal roughage can be incorporated into a self-feeder. Instead, free-choice hay or grazing is provided in addition to the concentrate in the feeder. The use of slower-fermenting grains and high-fiber byproducts buffered with mineral supplements and additives is desirable in formulating a self-fed ration. Some very good commercial products also are available for blending with grain to control intake effectively.

Management of self-feeding includes a number of factors: Generally 4 to 6 inches of feeder space should be provided per head. Control fines in preparing feed and opt for coarse or whole grains versus a situation of accumulating fines in the feeder troughs.

Starting new cattle on a self-feeder is particularly risky. Formulate for safe feeds, set the slide to restrict feed flow and consider adding a limiter. Once on feed and a good pattern of eating has been established, avoid drastic changes to the ration and monitor the feeder closely following storm events. Never let the self-feeder run empty because that likely will result in overeating, acidosis and bloat when it’s refilled.
The N.D. Beef Industry Survey: Yesterday, Today and Into the Future
Carl Dahlen, NDSU Extension Beef Cattle Specialist
Joleen Hadrich, NDSU Department of Agribusiness and Applied Economics

Decreasing cow numbers, increasing input costs, unprecedented market volatility and competition for labor resources: Beef producers face these issues and many more as they strive to maintain their livelihood and plan for the future of their operations.

For these reasons, a group of industry stakeholders has engaged in an ongoing dialogue to develop profitable beef systems to meet the needs of a changing beef industry structure in North Dakota.

To ensure efforts are meeting the needs of the beef industry, gathering input from current and future producers is imperative. One of the action items the industry stakeholder group asked NDSU to participate in was the development of survey instruments for both producers and students to complete. Faculty in the Departments of Animal Sciences and Agribusiness and Applied Economics at NDSU collaborated to develop the survey. Considerable input was gathered from beef producers and members of the industry stakeholder groups.

The survey goals include determining:

- How current and future producers perceive the future direction of the North Dakota beef industry
- Attitudes regarding methods of enhancing farm/ranch profitability
- How agencies and groups involved can meet the future needs of North Dakota beef producers

The student survey will be sent electronically to a representative sample of students enrolled in agricultural programs in the North Dakota University System. Students will have the opportunity to fill out the online survey during a two-week period. Results from this survey will give an indication of how future producers perceive the outlook for the beef industry, including perceived barriers to pursuing a career in the beef industry and the status of conversations about the transfer of operations to this next generation of producers.

Both the student and producer survey will include an identical set of questions designed to compare attitudes of current and future beef producers, as well as determine appropriate programming efforts and the best medium for information delivery for each of the respective demographic groups.

If you happen to be one of the producers receiving the survey or are a student who receives the online survey, please take the time to complete it. Your responses will remain anonymous and no individual information will be disclosed. Your input is vital for us as we move our industry forward!
The Carrington Research Extension Center is north of Carrington, N.D., on U.S. Highway 281. The center’s central location provides applicable agricultural research information to the majority of the state’s eco-regions.

The center was developed in 1958. Originally called the Carrington Irrigation Station, its mission was to study irrigation in North Dakota after the development of the Garrison Dam. In 1986, the state’s first Research Extension Center was constructed at Carrington (built at no cost to the state) to promote collaboration between researchers and Extension faculty. The center has since achieved worldwide recognition for production research and education in agronomy and animal science.

**Overview**

The CREC’s research and outreach/Extension programs cover a multitude of crops and all phases of beef cattle production. Research efforts focus on traditional crop variety evaluation, crop production and management, plant pathology, weed control, alternative crop development, cropping systems, soil health, irrigation, integration of crop and livestock production, beef cattle feeding, feedlot management, cow/calf production, foundation seed production, and northern fruit and berry evaluation.

The center operates on 1,750 acres, including about 350 irrigated acres. The remaining acreage is managed as dry land, primarily for research activities. Of this land base, 900 acres is leased or rented for supplemental seed, feed and research needs. The center maintains 120 head of Red Angus x Simmental cows and finishes about 500 head of beef calves for terminal markets, generating research information on livestock production for local, regional and international livestock producers. Most of the livestock research conducted at the center is supported by grants.

**Livestock Research**

In 1972, the center received legislative authorization to establish a livestock unit, with beef production as the focus. The unit’s mission was to investigate efficient beef production on a limited land base. Today, this program has grown to include beef feedlot nutrition, beef cow/calf production, integration of crop and livestock production, livestock waste management, low-stress stockmanship and animal husbandry, as well as bison nutrition and management. The livestock research has focused on feeds available in North Dakota and livestock production challenges and opportunities in our region.
Collaboration

Research projects at the center often involve campus faculty in Animal Sciences and other departments, with research objectives in meats, metabolism of feeds, animal health, nutrient management and environmental impact of cattle feeding in North Dakota. Projects include collaboration with other Research Extension Centers that produce feeder calves for finishing in trials at Carrington. In some studies, feeder calves are consigned by producers who want to learn more about the feedlot performance of their cattle. Some research topics address the priorities of commodity groups in North Dakota.

Livestock Outreach and Extension

Five faculty members conduct aggressive Extension and research outreach activities from the center. Program activities include the NDSU Feedlot School; the publication of annual research reports, Extension publications and a nutrient management newsletter; field day tours; commodity and other group tours; county livestock improvement participation; commodity group meetings; individual consultations on site, by phone or email; and mass media news releases.

The center has two faculty researchers in livestock (Vern Anderson, animal scientist, and Breanne Ilse, research specialist), one area Extension livestock specialist (Karl Hoppe) and two nutrient management faculty (Ron Wiederholt and Chris Augustin) with research and Extension appointments. Faculty present research findings and Extension programs in person and via electronic media to producer groups throughout the region and at professional meetings across the U.S. and internationally.

Research and Extension activities at Carrington support the international activities of the North Dakota Trade Office, Mid-America Consultants International, Northern Crops Institute and North Dakota commodity group trade teams. Faculty also work closely with the North Dakota Stockmen’s Association and the Feeder Council, Natural Resources Conservation Service and Northern Crops Institute.

Future

With the development of more terminal markets for fed cattle in the region and the exceptional quality of the feeder cattle in North Dakota, feedlot research and Extension programming will continue working to enhance the value of our high-quality cattle, minimize environmental impact, and increase the productivity and profitability of livestock enterprises in North Dakota.

For more information, visit the center’s website at www.ag.ndsu.edu/CarringtonREC/.
Pasture quality and quantity in a given area is largely related to environmental conditions, which are variable from year to year. Poor-quality pastures can affect the nutritional and physiological status of not only the dam; they also can impact the development and lifetime productivity of the calf.

During early pregnancy, nutrient requirements for beef cows are low and appear trivial for calf growth. However, maternal nutrient intake at this point can influence early organ development of the fetus. More importantly, the calf’s placenta is growing rapidly and establishing itself as the organ essential for nutrient exchange between the calf and dam throughout the remainder of gestation. Factors that impair placental development early in pregnancy could, therefore, have major impacts on calf development during later pregnancy.

The specific objective of this study, funded by the U.S. Department of Agriculture, is to examine how restricting nutrient delivery and subsequently feeding to nutrient requirements from early to midgestation can affect the development of placental blood vessels and the fetus. Our hypothesis is that maternal nutrient restriction in beef cows during key developmental stages of the placenta will alter its function, resulting in stunted fetal growth and development. However, delivering diets of greater nutrient content later in the pregnancy may enhance placental function, allowing for adequate nutrients to be delivered to the fetus.

We also are determining how nutrition during pregnancy can influence the development of the mammary gland, the organ that replaces the placenta upon birth in delivering nutrients to the calf.

Forty-eight pregnant beef cows are housed in pens (five to six cows per pen) equipped with the Calan gate system at the NDSU Animal Nutrition and Physiology Center, which allows us to control individual feed intake. All cows are being fed a common diet (100 percent of National Research Council’s nutrient requirements) until day 30 of pregnancy, at which time they are assigned to one of three treatments. In those treatments, the cows receive: 1) 100 percent of requirements throughout the study; 2) 60 percent of requirements from days 30 to 85, thereafter 100 percent of requirements; or 3) 60 percent of requirements from days 30 to 140 of pregnancy, thereafter 100 percent of requirements.

We can determine how maternal nutrition is impacting placental function by monitoring blow flow to the uterus and fetal umbilical cord. This is done by using a Doppler ultrasound, and measurements are obtained chute-side. Body weights are taken weekly to adjust rations for changes in body weight throughout the experiment. Refusals also are collected weekly, and body condition scoring and carcass ultrasounds are being performed throughout gestation. On days 85, 140 and 250, cows from each treatment are harvested at the NDSU Meat Laboratory.
Research Corner (continued from page 7)

Tissues from the dam, placenta and fetus are weighed and processed carefully. For us to further investigate placental function, we collect portions of the placenta and placental arteries. We are looking for factors associated with increasing placental vascularity and ability of the arteries to expand or dilate, allowing more blood to enter the placenta. We also are processing the mammary gland and will determine how maternal diet impacts its growth and potential capacity for milk production.

To maximize the amount of information learned, many scientists from the Department of Animal Sciences are involved in this research effort. We are making every attempt to harvest any organs and tissues from the dam and fetus that may give us insight into how diet during gestation impacts the cows and her developing fetus.

Several findings from this study will help expand our knowledge of maternal nutrition and calf development. They include: 1) how maternal diet impacts uterine and umbilical blood flow (how nutrients are delivered to the calf); 2) how the timing of delivering extra nutrients can impact placental development, and thus nutrient delivery to the calf; and 3) how maternal nutrition during pregnancy impacts the development of the mammary gland, thus postnatal calf nutrition.

The information gathered from these experiments will be critical in developing future research efforts to focus on specific management strategies for producers to implement during times when pasture nutrient quality or quantity are inadequate for gestating beef cows. Specific strategies to explore may include the stage of pregnancy that has the most benefit from supplementation, the duration of supplementation and the specific nutrients that should be delivered in the supplement.

Upcoming Events: January-February 2012

<table>
<thead>
<tr>
<th>Event</th>
<th>Location</th>
<th>Date</th>
<th>Contact Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>KMOT Ag Expo</td>
<td>Minot</td>
<td>Jan. 25-27</td>
<td>(701) 857-6444</td>
</tr>
<tr>
<td>SW ND Beef Day</td>
<td>Bowman</td>
<td>Jan. 26</td>
<td>(701) 523-5271</td>
</tr>
<tr>
<td>Dakota Feeder Calf Show Open House</td>
<td>Carrington</td>
<td>Feb. 9</td>
<td>(701) 652-2951</td>
</tr>
<tr>
<td>USDA ARS Research Review</td>
<td>Mandan</td>
<td>Feb. 21</td>
<td>(701) 663-6445</td>
</tr>
<tr>
<td>ND CornVention</td>
<td>Fargo</td>
<td>Feb. 22</td>
<td>(701) 364-2250</td>
</tr>
<tr>
<td>Barley Production and Utilization as Feed</td>
<td>Carrington</td>
<td>Feb. 28</td>
<td>(701) 652-2951</td>
</tr>
</tbody>
</table>

To get your events included on the Ranch Hand’s upcoming events list, email event name, location, date and contact number to Carl.Dahlen@ndsu.edu.
Management strategies to consider in the coming month:

1. Cattle requirements are increasing and herds have calves being born; be sure to match diets with requirements
2. Review feed inventories and re-evaluate your plan for allocating feed to cattle in light of current winter conditions
3. If cows are in great condition, save better-quality hays for feeding after calving; consider which hay to carry over for next year
4. Increase feed deliveries in cold weather (yes, we actually may have cold weather this year!) and consider feeding in the afternoon; this keeps cattle warmer at night and can shift calving to daylight hours
5. Prepare for calving (everything from pre-calving vaccinations to getting all supplies ready) if your cows are getting close
6. Review health, feeding and implant strategies for newly purchased backgrounded calves to optimize performance unless natural premium outweighs opportunity cost
7. Secure seed and fertilizer purchases for planting in spring of 2012
8. Familiarize yourself with expected progeny differences (EPDs) and current breed average EPDs and how you can use these numbers in your breeding program
9. Review existing bull inventory, reflect on 2011 calf crop, determine needs for 2012 breeding season and purchase accordingly
10. Take time to set goals for your operation in 2012; this gives everyone on your operation something to strive for

More Information
NDSU Extension Service agents or specialists:
www.ag.ndsu.nodak.edu/directory/extdir.htm
NDSU Department of Animal Sciences:
www.ag.ndsu.edu/ansc/
CattleDocs: www.ag.ndsu.edu/cattledocs

For more information on this and other topics, see www.ag.ndsu.edu

NDSU encourages you to use and share this content, but please do so under the conditions of our Creative Commons license. You may copy, distribute, transmit and adapt this work as long as you give full attribution, don’t use the work for commercial purposes and share your resulting work similarly. For more information, visit www.ag.ndsu.edu/agcomm/creative-commons.

County commissions, North Dakota State University and U.S. Department of Agriculture cooperating. North Dakota State University does not discriminate on the basis of age, color, disability, gender expression/identity, genetic information, marital status, national origin, public assistance status, race, religion, sex, sexual orientation, or status as a U.S. veteran. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701) 231-7708. This publication will be made available in alternative formats for people with disabilities upon request, (701) 231-7881.