

BEEF Q & A

BEEF QUESTIONS AND ANSWERS



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INSIDE:

- BVD-PI Herd Screening..... 2**
- Strategic Supplementation of Young Cows for Reproduction.. 6**
- Wildlife in Winter: Are they affecting your rangeland forage more than you think? 7**
- Natural Beef: What are the Opportunities.... 11**
- New Appointments at Montana State University 12**
- Nitrate Toxicity in Montana Forages.....13**
- U.S. Beef Outlook.....16**

Beef Checkoff Program Top Accomplishments of 20 Years

by Charlene Schuster, Executive Director



To celebrate the 20th anniversary of the national Beef Checkoff Program on Oct. 1, program representatives set out to identify key checkoff accomplishments that have made a distinct impact on beef demand.

The programs funded to date have built the foundation for the future. Research has helped us to know our product and communicate to our consumers. Our promotion and information programs are successful because we have the facts. Through the years, the influence that the entire program has had on how consumers buy and perceive our product has been significant.

After nearly 20 years of decline, demand for beef turned the corner in 1998, and despite a small decline in 2005, has maintained a sharp upward trend, advancing more than 20 percent since 1998.



ANNIVERSARY

Programs that are making a difference...

Beef. It's What's for Dinner. Consumer advertising has made beef even more recognizable. Research shows that more than 80 percent of people surveyed recognize the "Beef. It's What's For Dinner®" ads.

Beef Nutrition. Checkoff-funded research has confirmed that, calorie for calorie, lean beef packs a punch. Twenty-nine beef cuts now meet government guidelines for lean, which is good news for a country battling obesity.

Carcass Value. Checkoff Muscle Profiling research has improved carcass value by creating new products from previously underutilized muscles in the chuck and round like the flatiron and ranch cut.

Continued on page 11



Beef: Questions & Answers is a joint project between MSU Extension and the Montana Beef Council. This column informs producers about current consumer education, promotion and research projects funded through the \$1 per head checkoff. For more information, contact the Montana Beef Council at (406) 442-5111 or at beefcncl@mt.net



BVD-PI Herd Screening

By Clint Peck, Director of Montana Beef Quality Assurance

As 2006 winds down we're evaluating the first phase of the Montana BVD-PI Herd Screening Project and looking ahead to next year's screening initiatives. The focus of the project is to investigate the role of screening cattle herds persistently infected (PI) with the bovine viral diarrhea (BVD) virus.

The objective is to improve the overall health of Montana's cow herd and add value to the state's calf crop. By year's end we'll have screened nearly 35,000 calves, heifers, cows and bulls. Formal results of the project can be obtained by contacting the Montana BQA office or going to the BQA website (www.mtbqa.org) and clicking on "Projects."

The PI project is a function of the Montana State University Beef Quality Assurance program. It's a collaborative effort with the Montana Stockgrowers Association and Animal Profiling International, Portland, Ore.

The relationship between disease in cattle and the quality and consumer acceptance of beef products cannot be overlooked – and this is why this project is an important component of the Montana BQA program. There is significant research correlating treatment for sickness and beef quality grade and a tenderness score.

The project also emphasizes how important ranch biosecurity is in preventing BVD and in the elimination of PI calves. It also emphasizes a "management-over-medicine" approach to herd health management.

How it works...

The screening is based on a small "ear-notch" sample taken from an animal and analyzed at the lab for the presence of the BVD virus. The lab uses the "pooled" polymerase chain reaction (PCR) analysis. Pooling is strategy that takes advantage of the high sensitivity of the assay while reducing the cost per animal tested. Fluid from the samples is pooled in groups of 28 samples for analysis.

Based on extensive research conducted at Colorado State University and elsewhere we have full confidence in the sensitivity and accuracy of the pooled PCR approach to screening for PI animals.

If the DNA of the virus is detected in the pool, fluid is again drawn from each individual ear notch and analyzed individually to determine which sample(s) are contributing the virus to the pool. That sample is then matched to the animal ID number and the owner is notified which animal was infected at the time of sampling.

API was chosen through a competitive bid process as the least-cost lab when you consider both "pooled" screening and retest costs on positive pools. It's also the only lab we know that can assure "next business day" screening results. This means a rancher or feeder can usually expect results before suppertime the day after overnight shipment.

We advise separating the infected animal from the herd and waiting three weeks and re-ear notching the animal. This is done to confirm that the animal is PI and not "transiently" infected with the BVD virus at initial screening – which happens in rare cases.

The focus of the project is mostly on "whole herd" screening of cattle breeding herds for PI cattle. It's usually an effort in finding needles a haystack – but "needles" that can do a lot of damage on individual ranches and greatly impinge on the reputation of a cattle herd.

The main negative health effects of BVD virus are that it can inhibit conception and cause abortion in susceptible females. BVD also suppresses the immune system. In some cases BVD's effect on the immune system is more critical than the acute effects of the virus itself. This makes controlling BVD at the ranch all the more critical and cost-effective.

“Creation” of PI calves

PI calves can develop in the uterus of the dam if the heifer or cow is exposed to the BVD virus during the first part of gestation – about 40-125 days after conception. In fact, this is the only way a PI animal is “created.”

Other important points:

- A calf is born PI will always be a PI animal.
- If an animal is not PI at birth, it can never become PI.
- Persistently infected females will always produce a PI calf.

Although a high percentage of PI calves die at or near birth – or at least by weaning – many PI calves survive can be healthy-appearing and enter the breeding herd or be offered for sale. PI animals usually have a very high and persistent amount of virus circulating in their blood and other fluids. They are very efficient transmitters of BVD virus.

The scientific literature indicates persistent infection has a clustered distribution, which means very few herds contain several PI cattle. Clustering of multiple PI animals in a herd is primarily due to exposure of numerous susceptible dams to a PI or transiently infected source of the BVD virus. Therefore, the target of the ranch-based screening projects has been to keep PI cattle out of breeding herds.

Of course, aborted fetuses, dead calves, deformed calves, heifers that won't breed or stay bred, or other suspect cattle should be tested for PI status routinely unless cause of death is known. Tissue from freshly dead cattle can be submitted for analysis.

Special considerations

Feedlots and heifer development operations present a special biosecurity challenge because the opportunity to introduce BVD PI animals into these systems is increased when cattle are commingled from multiple sources. There are an increasing amount of cattle feeders screening calves coming into their feedyards for PI status.

Some feeders are asking ranchers to screen their herds before or at weaning.

We had a ranch in our project that was encouraged by his feeder to screen his calves before shipping. In that case, the order buyer is sharing the cost of screening with the rancher.

We've also seen Montana PI project calves show up on video sale listings and market websites as being “PI” screened. We expect more post-weaning screening activity as the fall progresses. At least one Montana auction market operator is saying that PI-screened calves are already “easier to sell” this fall. We've had calls from out-of-state cattle feeders who are asking for a list of ranchers who are entered in the screening project.

Our recommendations

It's highly recommend that all ranchers – seed-stock and commercial – who market breeding cattle screen those animals for PI status prior to sale if they were not previously screened. This will provide adequate assurances to both buyer and seller that breeding animals – bulls and replacement cows and heifers – are PI-free. If the animal's health management history is unknown, buyers have every right to ask that they're screened for PI status prior to delivery.

We're not recommending perpetual PI screening from a cow-calf management standpoint. We're suggesting that once a rancher screens a herd according to our project protocol (whole herd screening), he or she can be reasonably sure of a PI-free cattle herd given the following management regime:

- 1) A proper vaccination protocol based on use of modified-live vaccines.
- 2) A sound, common-sense biosecurity program.
- 3) Screening of all new additions to the cow herd.

There may be justification on a herd-by-herd basis for testing of calves from all younger cows (2 & 3- year-olds). These animals, even with vaccination may not have fully developed immunity to the BVD virus.

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The 2007 Project

We will continue the Montana BVD-PI Herd Screening Project for the next two years. Therefore, we're looking for volunteers who either want to help us gain more data on Montana cattle – or suspect that they have BVD in their herds.

In 2007 we'll again be offering technical assistance, cost-share funding and easy-to-use sampling kits for all participants. Our goal is to enroll 100,000 head of cattle in this year's project.

Montana cattle ranchers, individually and col-

lectively should be proud of the leadership they've demonstrated in this voluntary industry-driven approach to animal health management. While they're helping themselves improve the health of their individual cattle herds, they deserve to be recognized and rewarded for their work. If you'd like more information about this project, feel free to give us a call.

For more information and/or project participation forms contact the Montana BQA office at 406-896-9068 or go to www.mtbqa.org.

BVD PI Herd Screening Project – Lessons Learned

The prevalence of BVD-PI in the nation's and Montana's cow herds has been estimated to be less than 1 per 1,000 animals. Our project, in fact shows a lesser prevalence – but this is not sound statistical data. We hope in future phases of the project to have better statistical sampling of Montana's cattle population.

So far, we've found only **24 PI animals in the 30,800 head officially enrolled in the project (.078% of 30,800). The 24 PIs were found on only 4 of the 65 ranches in the project.**

This represents the typical and historical PI pattern worldwide – few PI animals overall, but devastating impact on ranches where the virus spreads through the breeding herd. More important than overall prevalence though is a determination of PI risk factors:

- 1) No BVD vaccination program in place or poor active immunity.
- 2) "Put together" herds or frequent co-mingling.
- 3) Replacement heifers with unknown vaccination history.
- 4) Lack of a surveillance program.

BVD PI screening should be part of a system involving vaccination, biosecurity and overall herd health management. The screening protocol assists the producer in finding all PI animals in the herd and also assures that new arrivals are BVD PI free.

But, continued surveillance and vaccination for the BVD virus are critical.

Infectious disease models show after BVD virus is eliminated from a herd, the cattle become increasingly susceptible to new infections. The possibility exists of an outbreak with severe clinical signs following a new BVD virus exposure. Thus, in the absence of strict biosecurity, recurring patterns of re-infection with severe clinical signs are expected every few years following elimination of the virus.

Finally, ear-notches and documentation showing a herd's been screened for PI status should be something to be proud of – and of which a value should be placed. Even in those herds where we find PIs, we encourage ranchers to be open and frank about their efforts to eliminate PI animals.



June pasture in Baker, Mont.

These cattle are going to be worth more money as

Key Points:

- Test animals before bull turn out to avoid exposure of a PI during breeding.
- Mature cows do not need to be screened unless they have a positive PI calf.
- Individual ID is critical to match all samples with the animals tested.
- A plan should be developed to eliminate PI animals from the herd.
- There's no need to retest a negative PI animal.
- PI surveillance should include the necropsy examination of aborted fetuses, stillborns and pre-weaning deaths.
- PIs that live to be breeding females can horizontally transfer of the virus to other animals in the herd – and they will always produce a PI calf.
- Open heifers should be tested before purchase or before commingling with herd.
- Bulls should be purchased as BVD PI free.
- All calves purchased for grafting should have an ear notch sample taken.
- Recipient females in an embryo transfer program should be screened.

Strategic Supplementation of Young Cows for Reproduction

By Rachel Endecott, Extension Beef Specialist, Montana State University

Maintaining a yearly calving interval is imperative for a beef cow to remain a profitable calf producer in the herd, and can be a demanding task for young range beef cows. Even with supplementation, young cows experience a period of negative energy balance and weight loss before and after calving, and their response to supplementation may vary from year to year. Poor reproductive performance of first- and second-calf cows is a challenge faced by cow-calf producers in the West. Poorer-than-expected cow response to supplementation may be partially due to low availability of glucose (blood sugar) and impaired absorption of available glucose into tissues. Cows absorb little glucose from their diet and rely on their body to produce glucose from other precursors. If precursors are absent or in limited supply, glucose availability and absorption may be impaired, which might result in a shift in nutrient partitioning toward milk production at the expense of body weight gain and return to cyclicity. Increasing the supply of glucose precursors in the diet may shift nutrients back toward postpartum weight gain and reproduction. Propionate, a volatile fatty acid, is a primary precursor for glucose production. We investigated responses of 2- and 3-year-old postpartum cows to different amounts of propionate salt added to range protein supplements.

Experimental Approach

Supplements were fed twice weekly at a rate of 2.5 lb per day for 70 days postpartum. Supplemental crude protein (CP) was approximately 50 percent ruminally degraded protein (RDP; degraded mostly in the rumen) and 50 percent ruminally undegraded protein (RUP; passes through the rumen relatively undegraded) and were fortified with minerals and vitamin A. All supplements (30 percent CP) were based on wheat middlings, cottonseed meal, and feather meal, with increasing proportions (0, 80, or 160 g/d) of propionate salt (NutroCAL™, Kemin Industries, Inc., abbreviated as RUP0, RUP80, and RUP160).

Outcomes and implications: What does this mean?

A supplement by year interaction was observed for days to first estrus (Table 1). Cows fed RUP0 and RUP160 took longer to return to estrus in 2004 than in 2003, while cows fed RUP80 returned to cyclicity in similar days postpartum regardless of year. Cows fed RUP80 were able to overcome year-to-year variation in this crucial reproductive measurement.

Table 1. Supplemental propionate and year interacted to affect days to first estrus of 2- and 3-year-old postpartum cows.

Supplement	Year	
	2003	2004
RUP0	56 d	78 d
RUP80	66 d	65 d
RUP160	60 d	70 d

Milk production for cows fed RUP80 was lower than for the other two supplement groups, but did not impact calf weaning weight (Table 2).

Cows fed moderate amounts of glucose precursors partitioned nutrients away from milk production and exhibited more consistent return to estrus. Strategic supplementation with a combination of glucose precursors may be best suited to shift nutrient partitioning in young postpartum range cows grazing dormant forage, and may serve as a tool to enhance cow longevity and sustainability of extensively managed ranches.

Table 2. Production responses of 2- and 3-year-old postpartum cows fed supplements with increasing amounts of propionate salt as a glucose precursor.

Response	SUPPLEMENT		
	RUP0	RUP80	RUP160
Fall pregnancy rate	100%	100%	91%
Calving interval	367 days	361 days	369 days
Cow weight change— calving to breeding	-4 lb	2 lb	-11 lb
Milk production (60 days postpartum)	18.3 lb	15.9 lb	19.2 lb
Calf weaning weight	530	524	519

WILDLIFE IN WINTER:

Are they affecting your rangeland forage more than you think?

by Tracy Brewer, Research Assistant Professor of Range Science, Joe Skeen Institute for Rangeland Restoration, Dept. of Animal and Range Sciences, Montana State University

The age-old wildlife dilemma persists on private ranches – most people enjoy having them around...until there are too many. Often times, “too many” elk, mule deer, etc. is reached when high numbers of wildlife coming down from high elevations in winter begin to reduce the amount of residual forage that was left in pastures by a conscientious grazing manager at the end of the grazing season. However, if wildlife are present on your ranch every winter and are seen using the same areas of the ranch and the same forage resources annually, they are likely having more impact than simply removing left-over forage.

Effects of long-term, heavy winter grazing

Many believe that winter grazing has no adverse effects on plants because they are dormant and

physiologically inactive. However, I would caution that long-term, heavy grazing in winter can have negative impacts on desirable rangeland forage species. In Montana, wildlife depend heavily on foothill rangeland in winter because it collects less snow and provides ready access to winter forage. If wildlife persist on the same areas year after year and rely on the same forage resources annually, it is very likely that the plant vigor and abundance of desirable forage species on those sites are being compromised. Additional impacts of repeated heavy grazing by wildlife include the promotion of less desirable plants, such as dense clubmoss and unpalatable grasses, soil compaction, and a reduction in the depth of the organic soil layer which provides nutrients that are recy-

Continued on page 11

Strategic Supplementation of Young Cows for Reproduction *continued from previous page*

Are the benefits worth it?

Feed costs for the supplementation period of this study were \$21.09, \$30.27, and \$39.89/cow for RUP0, RUP80, and RUP160. To compare benefits of supplementation strategies, results of a previous, similar experiment and the present study were combined (4 years of data). In all years, RUP80-fed cows produced less milk and cycled earlier. Both groups of cows had equivalent calf growth (2.3 lb/day of age) and estrous cycle fertility. A financial comparison (Table 3) was calculated to predict hypothetical results of

two 100-cow herds fed either RUP0 or RUP80 for 70 days postpartum. Additional feed inputs for the year included free-choice mineral and prepartum supplement. RUP0 calves were assumed to be 205 days old at weaning, and all calves were valued at \$1.00/lb at weaning. Even though feed costs for the year were higher for cows in the RUP80 group, their calves had potential to be heavier at weaning because cows fed RUP80 bred back sooner than cows fed RUP0. This resulted in an increase in income of \$17.82/cow when RUP80 was compared to RUP0.

Table 3. Hypothetical financial comparison of two 100-cow herds fed either RUP0 or RUP80 supplements. Feeding RUP80 resulted in a predicted increase in income.

Supplement	Pregnancy rate (%)	Days to first estrus	Predicted lb calf weaned/cow exposed	Yearly feed cost (\$/cow)	Predicted income difference (\$)
RUP0	91.4	98	431	\$32.41	—
RUP80	93.1	89	458	\$41.59	\$17.82

Natural Beef: What are the Opportunities?

John Paterson, Extension Beef Specialist

Based on a survey conducted by county agents this fall, one of the top questions that producers had was about natural beef programs. The following may help to answer some of these questions.

Just exactly what is “natural” beef?

USDA defines natural beef as minimally processed containing no additives. Meat companies can expand the definition of natural to include specified production practices such as programs to restrict or ban the use of hormones (implants) or antibiotics (eg. Rumensin, LA 200, etc). (Maday, Dovers J., 10/16/06)

Why does the consumer choose natural or organic foods? In one survey, 58 percent of respondents listed the environment, 57 percent said support for small or local farmers; 54 percent said health concerns, 42 percent said better quality and 32 percent believed that organic foods tasted better. (Smith, CSU).

Is natural beef a growth market? Natural beef accounts for about 1 percent of all beef sold in the USA while organic beef accounts for about one-tenth of 1 percent of beef sales. Even though the market is small, it is growing at a 20 percent annual rate. Organic food has sales in excess of \$10.4 billion and is the fastest growing segment of the food industry. It has been estimated that the natural and organic meat market will expand from \$2.3 billion in 2004 to \$5.5 billion in 2009 (Maday, 10/16/06).

What companies are selling natural beef? Nolan Ryan Guaranteed Tender Meats, B3R Country Meats, Laura’s Lean Beef, HarrisRanch and Maverick Ranch. In addition, National Beef recently launched a natural beef product and Tyson Foods also introduced two lines of natural beef, one in cooperation with Certified Angus Beef (Perkins, 11/2/06).

Does it cost more to produce natural or organic certified products?

Rodney Preston (emeritus professor from Texas Tech University) verified the fact that organic products are significantly more costly than conventional foods produced by modern technology, as shown in the following table. Much of the difference appears to be due to more expensive ration costs for organic food items.

Cost of Organic vs. Modern Technology Food Items

Food item	Organic cost, \$	Modern technology cost, \$	Cost ratio, organic vs. modern tech.
1 doz. large eggs	2.99	0.99	3.0:1
0.5 gal. 2% milk	3.29	1.84	1.8:1
1 lb. cauliflower	2.99	1.99	1.5:1
1 lb. filet	41.50	15.00	2.8:1
1 lb. lean ground beef	6.00	3.50	1.7:1
1 bu. yellow corn	41.45	1.90	21.8:1

SOURCE: R.L. Preston. 2006. Plains Nutrition Council Conference.

Honeyman and others (2006) from Iowa State University compared conventional (implanted, grazed grass and then finished in feedlot; 185 days) production to a system in which steers grazed grass then standing corn and were finished in the feedlot on corn and hay (340 days). Overall gains for the implanted, conventionally raised steers were 3.3 lbs/day vs. 2.0 lbs/day on the grass-based system. Steers which grazed grass and corn required an additional 155 days to finish to desired carcass weights compared with the conventional steers.

What are the requirements for producing natural beef? As one example, Clint Peck the Senior Editor of BEEF Magazine (April, 2004) profiled Meyer Natural Angus Beef and outlined the following standards that producers must follow.

- *Minimum 50% Red or Black Angus genetics.*
- *No added growth promotants, hormones or implants in the animal's lifetime.*

- *No antibiotics or ionophores administered in the animal's lifetime.*
- *No animal by-products in feed.*
- *Born and raised in the U.S.*
- *Producers are encouraged to assemble loads of a minimum of 50,000 lbs.*
- *Weaned at least 45 days before leaving the ranch.*
- *Labeled use of vaccines is allowed.*
- *Raised under Human Farm Animal Care guidelines.*
- *Allow visits by Meyer personnel to certify all standards are being met.*
- *At time of delivery, cattle are sound, in a merchantable condition and free of disease and lameness.*
- *Complete, accurate records must be kept.*
- *All vaccinations given subcutaneous or in the neck area with no more than 5 cc/site.*
- *Any animal treated with an antibiotic, or disqualified for any above reason, must be marked for removal from the natural program.*

Product Safety: Conventional vs. Natural vs. Organic Foods. Gary Smith from Colorado State University (Maday, Drovers Journal, 10/16/06) said the availability of beef with specific “credence at-

tributes,” or what he referred to as “designer beef,” is positive for the industry and consumers. There are some consumers who simply would not eat beef if all they could get was commodity product from the conventional production system. If they want “natural,” “organic” or “grass-fed” beef, and are willing to pay for it, that demand creates profit opportunities for producers and processors.

A key issue, Smith says, is the way in which natural or organic products are marketed to the public. Claims such as “chemical-free” or “hormone-free” simply are false since all foods are comprised of chemicals and animals produce hormones naturally. Unsubstantiated claims that a product is healthier or safer than conventional beef also are misleading and harmful to the industry. Designer beef offers consumers a choice, but he says, “Don’t make claims that are not supported by science.” Britt Hicks from Oklahoma State University, (September 2006) summarized a report from the American Council on Science and Health (2003) which concluded that natural and organic produced beef products did not differ from conventionally raised beef in terms of nutrition or safety.

Bottom Line: If you are selling “natural-certified” feeder calves, a premium is required.

FACT SHEET: Beef Choices

<p>Beef Choices</p>	<p>The more than 800,000 beef producers throughout the United States offer a variety of beef choices to meet the changing lifestyles and nutritional needs of consumers. Beef producers have adapted their practices to provide consumers with the grain-fed, grass-finished, certified organic or “natural” beef they desire. While each kind of beef offers specific value to consumers, all beef is safe and nutritious.</p>
<p>Nutritional Value of Beef</p>	<p>U.S. beef is leaner than ever and is a premier, naturally nutrient-rich food, which helps consumers get more nutrients from their calories.</p> <ul style="list-style-type: none"> • 29 cuts of beef (including 15 of the 20 most popular cuts) meet government guidelines for lean, like the tenderloin, sirloin and 95% lean ground beef. • Beef has eight times more vitamin B12, six times more zinc and two and a half times more iron than a skinless chicken breast.

FACT SHEET: Beef Choices *(continued from previous page)*

<p>Beef Safety</p>	<p>All beef goes through a rigorous inspection process and is subject to strict government guidelines to ensure the highest level of safety. All cattle are inspected by a public health veterinarian before entering the packing plant and those with any signs of illness are not allowed into the food supply.</p>
<p>Grain-fed Beef</p>	<p>Grain-fed is the most widely produced type of beef by the more than 800,000 beef producers across the United States. Grain-fed cattle spend most of their lives eating grass in pastures, then move on to a feedlot where they are fed a high-energy, grain diet for four to six months.</p>
<p>Grass-finished Beef</p>	<p>All beef is grass-fed, as cattle spend the majority of their lives in pastures eating grass. However, grass-finished beef comes from cattle that have been raised on pasture their entire lives. Grass-finished cattle may be raised according to the U.S. Department of Agriculture’s (USDA) National Organic Program (NOP) standards. However, grass-finished beef is not automatically considered certified organic as grass-finished cattle may be given Food and Drug Administration-approved antibiotics and/or growth promotants.</p>
<p>Certified Organic Beef</p>	<p>Beef must be from cattle that meet USDA’s NOP livestock production requirements to be classified as certified organic. The Organic Foods Production Act, effective October 2002, sets the standards for all food labeled organic (http://www.ams.usda.gov/nop/FactSheets/ProdHandE.html). For beef, this means:</p> <ul style="list-style-type: none"> • Cattle must be fed 100-percent organic feed, but may be given certain vitamin and mineral supplements. • Organically raised cattle may not be given hormones to promote growth or antibiotics for any reason. If an animal is sick, it cannot be denied treatment to ensure its health; however, animals treated with antibiotics must be taken out of the NOP. • All organically raised cattle must have access to pasture, but the majority of cattle in the U.S., regardless of how they are raised, meet this requirement. • Organic beef is certified through USDA’s Agricultural Marketing Service (AMS). Cattle must be raised using organic management from the last third of gestation.
<p>Natural Beef</p>	<p>By definition, most beef is natural. According to USDA’s Food Safety and Inspection Service (FSIS), natural may be used on a label for meat if:</p> <ul style="list-style-type: none"> • The product does not contain any artificial flavor or flavoring, coloring ingredient, chemical preservative or any other artificial or synthetic ingredient; and • The product and its ingredients are not more than minimally processed (FSIS Directive 7220.1 Policy Memo 55 “Natural Claims”). <p>The government’s definition of natural does not consider the manner in which animals are raised or what they are fed. Natural beef can be grain-fed, grass-finished or organic as long as it is minimally processed and contains no additives.</p> <ul style="list-style-type: none"> • Some beef products may be marketed and labeled “natural” based on the specifications of the company that owns the brand, such as “raised without growth promotants and antibiotics.”

For more information, visit www.BeefFromPastureToPlate.org

Updated 10/2006

Wildlife in winter: Are they affecting your rangeland forage more than you think? *continued from page 7*

cluded into the soil. The effects of long-term, heavy grazing are difficult to detect because changes to the plant community and soils occur very slowly. Therefore, monitoring persistence, abundance, and locations of wildlife populations present on your rangeland in winter can provide dramatic insight into the potential impacts they may be having on your rangeland forage.

Grazing management to alter wildlife grazing patterns

Summer livestock grazing can be used as a tool to change forage conditions to attract or deter wildlife grazing. This concept can be applied in areas that are continually selected or avoided by wildlife in winter to distribute use across the landscape and should be adjusted for the particular

species of wildlife present. Elk grazing in winter tend to avoid areas that were ungrazed by livestock the previous summer and prefer areas that were grazed moderately by livestock the previous summer. In contrast, mule deer grazing in winter prefer areas that were ungrazed by livestock the previous summer. Arm yourself with information regarding wildlife foraging preferences, an inventory of previous summer's livestock grazing intensities in each pasture, and observations of wildlife species present on your ranch and their preferred grazing areas on the landscape. Your livestock grazing management techniques can be adjusted to deter excessive, long-term grazing by wildlife that will eventually compromise your rangeland forage.

Beef Checkoff Program Top Accomplishments of 20 years *continued from page 1*

Consumer Confidence. BSE (bovine spongiform encephalopathy) made U.S. headlines in late 2003, but thanks in part to beef checkoff-funded efforts, consumers were reassured about the safety of the U.S. beef supply. Information programs helped maintain consumer confidence levels – which rose as high as 91 percent after the first case was discovered in the United States.

E. coli O157:H7. The U.S. beef industry has invested more than \$20 million in checkoff funds toward beef safety. Due in part to these research and implementation efforts, incidence of *E. coli* O157:H7 was reduced 80 percent in the past five years.

Foodservice Partnerships. During the last five years, the checkoff allocated about \$2 million to foodservice partnerships, with restaurant partners investing nearly \$123 million.

Foreign Marketing. During the first 10 years of the checkoff, beef exports nearly tripled. The United States lost 72 of its 133 foreign markets following a December 2003 BSE case. By mid-2006, however, 50 of those markets had reopened

and checkoff dollars immediately went to work to regain our market share.

New Product Promotion. The checkoff's BEEflexible promotion helped move 103 million pounds of Beef Value Cuts through foodservice channels last year, putting the new products on the menu in some 20,000 U.S. restaurants.

Nutrition Partnerships. *The Healthy Beef Cookbook* was produced via a checkoff information partnership with the American Dietetic Association in 2005 and generated 80 million impressions in consumer media in its first six months on the market.

Summer Grilling Promotion. The checkoff launched this annual promotion five years ago with combined state and national checkoff funds. In 2005, grilling cuts accounted for more than 67 percent of beef sales during the summer.

Youth Education. In 2005, beef checkoff information highlighted the role of beef in a healthy diet for teens. Checkoff-funded materials went to 35,000 teachers.

New Appointments at Montana State University



Clint Peck

The Montana Beef Network is pleased to announce that Clint Peck, Billings, has accepted the position of Director of Beef Quality Assurance for Montana. Peck has been the senior editor of BEEF Magazine and a regular contributor to Cow-Calf Weekly, BEEF's e-newsletter.

Peck grew up on a farm/ranch in the Yellowstone Valley and holds a degree in Agricultural Engineering Technology from Montana State University-Bozeman. In addition to his responsibilities for BQA education, he also teaches Global Beef Production Systems at MSU.

In 2003 he received "Story of the Year" honors from the American Agricultural Editors Association for a series profiling Brazilian beef production systems. This past spring and summer, Peck was the leader of a project designed to gauge the incidence of BVD in Montana cattle herds. Nearly 40,000 head of cattle were screened for persistent infection of the BVD virus.

He is also developing a new state of the art industry web site for BQA certification (<http://www.mtbqa.org>). In addition to other BQA programs, this winter he'll work with MSU Extension agents on a producer education series and tour focusing

on Mexican beef systems and consumer opportunities south of the border.

Clint Peck can be reached by email at cpeck_99@yahoo.com or by phone at his office in Billings (406) 896-9068.

Rachel Endecott

Rachel Endecott is the new MSU Extension Beef Cattle Specialist located at Fort Keogh Livestock and Range Research Laboratory in Miles City. She grew up on a cow/calf operation near McAllister, Montana, and received her bachelor's degree in Animal Science from MSU in 2001. Upon graduation, she continued her education and received her MS (2003) and PhD (2006) degrees from New Mexico State University in range beef cattle nutrition, with a reproductive physiology minor under the direction of Mark Petersen.

Her graduate research focused on evaluating range protein supplements for their potential to improve reproductive performance of young postpartum range cows while maintaining or lowering production costs. Her goal is to continue to investigate management strategies to lower unit costs of production to enhance sustainability of range beef cattle production.

"I look forward to meeting many of you in the next few months," Endecott said. "If you have questions or concerns or would just like to visit, don't hesitate to contact me."

Rachel Endecott, Extension Beef Cattle Specialist, can be reached by e-mail at rachel.endecott@montana.edu, or by phone at (406) 874-8286 – office, (406) 853-3956 – cell.

The address at the Fort Keogh Livestock and Range research lab is 243 Fort Keogh Road, Miles City, MT 59301.



MARK MANOUKIAN

Students enrolled in the Montana Beef Market Project, which is supervised by MSU Extension county agents.

Nitrate Toxicity in Montana Forages

by Dennis Cash, Extension Forage Specialist

Nitrate toxicity affects cattle production in Montana nearly every year. In this month's Beef Q&A we will try to answer some of the common questions regarding this potential risk.

What does nitrate toxicity look like in cattle?

Acute poisoning occurs within 30 minutes to 4 hours after ingestion of plants or water high in nitrate. The problem occurs very quickly and often you observe the cattle at feeding to be normal one day and dead the next day. A very early sign is salivation followed by frequent urination. Soon after, the cattle exhibit difficult breathing, increased respiratory rate, and dark brown colored mucous membranes or blood. The animals then become weak, reluctant to move, and have convulsions before they die. It is common to simply find some of the cattle dead. If pregnant cattle receive a dose that is not quite deadly, they may abort soon after recovering.

What causes the problem?

High levels of nitrate (NO_3) in the feed or water is the cause of nitrate toxicity. Nitrate is converted to nitrite (NO_2) in the rumen of cattle, and the nitrite is absorbed across the rumen wall and into the blood stream. Nitrite is competitive with oxygen (O_2) and it reacts with hemoglobin to form methemoglobin which restricts oxygen flow to cattle's vital organs such as the heart and brain. Most of the early symptoms of nitrate toxicity are associated with poor oxygen conditions – lethargy, dizziness, difficult breathing, and swollen or brown membranes. Abortions or deaths can quickly follow consumption of a lethal dose of nitrate.

Where does the nitrate come from?

Nitrate comes from a number of sources including livestock hay and drinking water, fertilizers, runoff from fertilizer or decaying organic matter, animal wastes or other sources of nitrogen. In Montana, we are primarily concerned with the nitrate concentrations in hay and water, since

these are routinely consumed at high levels. High nitrate concentrations are prevalent in cereal (oat, barley, wheat, etc.), millet and sudangrass hays, particularly when these are grown under drought stress or immediately behind plowing out an old alfalfa field. Under normal growing conditions and nitrogen fertilization levels, nitrate is rapidly converted to grain protein as the plant begins grain fill. Many weeds are also culprits for high nitrate concentrations – such as wild oat, lambsquarters, pigweed, kochia, Russian thistle, Canada thistle and quackgrass. Almost all forage crops can accumulate nitrate during immature growth stages and when grown under crop stress (drought, frost, cloudy, immediately after herbicide application).

How do I know if nitrate toxicity is the problem?

If your cattle die acutely and there has been a recent change in feeding practices or water source, you should suspect nitrate toxicity as a problem. In Montana, the single biggest risk occurs in the late fall when pregnant beef cows on dry range or pasture are fed a big supply of "suspect" hay after the first snowstorm. Uncontrolled intake of even a marginal level of nitrate is a high risk because the cows' previous diet did not require their rumen microbes to be efficient in digestion of high levels of nitrate, soluble proteins and other nitrogenous compounds. Feeding a "high-risk" oat or sudangrass hay, change in water supply, moving from one field to another can also be factors that increase intake and nitrate problems. There are a number of other common causes of acute death in cattle and other toxicities that must be considered. Your veterinarian can perform tests on dead cattle to determine the cause of death. For nitrate toxicity, samples from the eye of the dead cattle can be very useful to diagnose nitrate problems. Rumen samples, feed samples, and water samples are usually analyzed. The diagnosis is not always clear cut, and cows should immediately have their diet corrected to minimize further losses.

U.S. Beef Outlook

The Food and Agricultural Policy Research Institute (FAPRI), a collaborative project between Iowa State University and the University of Missouri, has published its annual agricultural outlook. They reported that the U.S. cattle herd continues to expand

in 2006, as producers respond to the attractive returns the industry has experienced since 2003. Cattle supplies will continue to grow through 2012, and then decline as a result of negative net returns that are projected to begin in 2009.

Price Projections for Cattle and Beef, 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
U.S. Dollars/Hundredweight								
Fed steers	87.28	83.93	81.68	79.35	76.46	74.19	72.35	70.94
Feeder steers	120.04	113.18	105.54	100.47	95.34	90.37	85.81	83.81
Utility cows	54.59	51.01	48.03	45.65	44.09	42.33	40.4	39.73
U.S. Dollars/Pound								
Retail beef	4.09	4.04	4.03	4.03	4.01	4.01	4.00	3.99
U.S. Dollars/Cow								
Cow-calf returns	138.20	70.93	31.79	6.75	-18.54	-40.90	-63.79	-78.02

SOURCE: Food and Agricultural Policy Research Institute, 2006. U.S. and World Agricultural Outlook, FAPRI Staff Report 06-FSR1 ISSN 1534-4533, Iowa State University, Ames, Iowa.

Nitrate Toxicity in Montana Forages *continued from page 9*

How do I treat affected cattle?

The most common antidote treatment for nitrate toxicity is methylene blue. This compound restores the hemoglobin function of oxygen transport. Methylene blue must be administered intravenously by your veterinarian, and it must be done very soon after the cattle are affected (within the first hour of symptoms). Obviously this antidotal treatment is not an option on far-flung Montana ranches, so you should consider all options to eliminate nitrate risk before it can occur.

How do I prevent nitrate toxicity?

First, consider all sources of feed and drinking water. MSU county agricultural agents can quickly detect high nitrate levels of standing

forage during the summer, but once your hay is in the stack, an accurate lab analysis of nitrate should be performed. High-risk hay – cereals, sudangrass, weeds, etc. grown under stressful conditions are suspect. Prior to winter feeding, you should thoroughly sample all your hay sources and livestock water. The nitrate concentration can vary tremendously within a stack of hay, so be sure to core from at least 20 bales from each lot of hay. We recommend routine lab testing for protein and TDN, and the added cost for nitrate testing is only \$12 to \$15.

What levels of nitrate should I be concerned about?

You can use the lab analysis to properly balance a ration for your wintering beef cattle, and assure

it has a safe nitrate level. The concentrations of nitrate and nitrite are expressed differently among labs. For example, the lab analysis might be in units of percentage (%) or parts per million (ppm), and for nitrate (NO_3), nitrate-nitrogen ($\text{NO}_3\text{-N}$) or potassium nitrate (KNO_3). First, use the lab value at 100% dry basis. Second, 10,000 ppm = 1% (move the decimal 4 places). Third, the lab's values of nitrate are all convertible: 1% NO_3 = 0.23% $\text{NO}_3\text{-N}$ = 1.64% KNO_3 . Be sure to consult with a veterinarian or an Extension agent to make sure you use the appropriate conversion. Below is a table of forage nitrate concentrations and associated risks.

OK, I got the nitrate values, now what do I do with them?

Based on the table above, some of your hay may not be suitable (>0.5% nitrate) for feeding your bred cows and heifers – use this hay for replacements or other non-pregnant livestock. It is possible to dilute “moderate nitrate” (0.15 to 0.50%) hay with hay known to have no nitrate by chopping or grinding and mixing. However, alternate feeding of moderate- or high-nitrate hay one day (or morning) and low-nitrate hay the next day (or afternoon) does not constitute mixing.

There are many other management considerations. Nitrate toxicity will occur from the combined levels of all feed and water sources, so check your water periodically. Most of us grossly underestimate feed intake, particularly in cold weather. For example, it is common to allocate 25 pounds of hay per day for cows (2 percent of their bodyweight, BW). For good-quality hay barley, we have noted intake levels over 3 percent BW, so this would increase daily nitrate consumption by 50 percent. Cows can gradually be adapted to tolerate increasing nitrate levels, and this is accomplished with feeds high in energy and protein. Recently, products that introduce effective strains of propionibacteria (as a feed additive or gel paste) into the rumen have been shown to be effective when feeding or grazing high-nitrate forages. Some useful references are:

<http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-1996/F-2903web.pdf>

<http://www.animalrangeextension.montana.edu/articles/Forage/General/Nitrate-tox.htm>

http://www.vetmed.ucdavis.edu/vetext/INF-BE_cca/INF-BE_cca01/INF-BE_cca0111.html

Forage Nitrate Concentrations and Associated Risks

Forage NO_3 at 100% DM		General interpretations for beef cattle <i>(adapted from Oklahoma State University and Montana State University)</i>
%	ppm	
<0.15	<1500	Generally safe for all conditions and livestock.
0.15 – 0.50	1500 – 5000	Generally safe for non-pregnant beef cattle. Potential loss of breeding performance and early-term abortions. Limit to 50% of ration for bred animals.
0.5 – 1.0	5000 – 10,000	Some risk to all cattle— limit feed to 25% – 50% of ration for non-pregnant animals. DO NOT FEED to bred animals. May cause abortions, weak calves and reduce milk production.
>1.0	>10,000	DO NOT FEED. Potentially toxic to all cattle.

JOHN PATERSON



Dennis Cash, Forage Specialist, discusses hay harvesting issues with ranchers in Whitlash, Mont.

JANNA KINCHELOE



Waiting for the judging to begin at the Rosebud-Treasure county fair.

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