



Raising Cattle “Naturally”

The Significance of Animal Health

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Raising cattle in a “naturally raised” program presents an opportunity for cattle producers to realize premiums for the cattle when marketed.

Specific requirements of “naturally raised” programs vary among individual branded programs, but commonly the programs disallow use of antimicrobials, ionophores, and hormones. Products such as antimicrobials and ionophores have customarily played a large role in prevention and treatment of disease conditions in cattle. In addition, products such as ionophores and growth implants substantially improve the growth performance and feed conversion of cattle receiving those products. Because of this, producers considering raising “natural” cattle need to consider the consequences presented by the unavailability of those animal health “tools.”

Treatment is costly in a “naturally raised” program

In conventionally raised cattle, treatment of a sick animal presents costs related to the treatment itself and lost production of the animal. In “naturally raised” programs, however, costs of a treated calf go beyond the simple cost of the treatment.

The treated calf will have to be removed from the “naturally raised” marketing channel and managed separately in regard to feeding and marketing. The treated animal may or may not fit into another conventionally managed group.

Treated calves will need to be “salvaged” in that they will need to be sold on the open market, which is especially costly for “naturally raised” calves that may have been purchased at a premium to the conventional market.

In addition, there are lost opportunity costs and a cost to the performance lost while the calf was being managed “naturally” vs. conventional management and feeding. (Information on production costs are in SDSU Extension Extra 2056, “Feeding Natural Cattle.”)

For these reasons, maintaining a healthy group of cattle is critical to the economic success of a “naturally raised” program. It is also important to realize that, from both an economic and animal welfare standpoint, sick calves in need of antibiotic treatment must be treated appropriately and removed from the “naturally raised” program.

What animal health products are or aren’t allowed in “naturally raised” cattle?

Different branded programs vary regarding specific products that they allow or disallow in their particular programs. Therefore, it is critical to become familiar with the specific requirements of the programs in which you want to participate.

In general, all antimicrobials, whether administered in feed, water, or by injection, are not allowed at any time in the calf’s life span. The same applies to ionophores

(such as Rumensin® or Bovatec®), hormones (growth implants, MGA®), and coccidiostats (such as Deccox® or Corid®).

From an industry perspective, these cattle are referred to as “never ever” cattle.

However, many animal health products are allowed in “naturally raised” programs and, in fact, are critical to disease prevention. They include:

1. **Vaccines.** Properly administered vaccines are extremely important in the prevention of conditions such as bovine respiratory disease complex (BRDC) and liver abscesses. Vaccine use ideally begins before weaning for BRDC prevention. Regardless of whether “naturally raised” calves are purchased or raised from birth, producers should employ the recommendations of their veterinarians in designing a vaccine program.
2. **Parasite control products.** Products to control internal (stomach worms, tapeworms) and external (lice, flies) parasites are not only important because of the drop in production that infested animals experience, but also because many of these parasites have an overall suppressive effect on the animal’s immune system.
3. **Antibody preparations.** Baby calves (especially) benefit from passive antibodies they receive early in life as a means of protection from diseases such as neonatal diarrhea (calf scours) and clostridial infections. Colostrum that the calf receives from its mother is of utmost importance, but colostrum supplements and replacers, antibody preparations (e.g. First Defense®, Ecolizer®), and injectable antitoxins, may also play a role in disease prevention in certain operations.
4. **Feed-grade microbials, bloat preventives and treatments.** These products may play a role in maintaining rumen health when ionophores are not available. These products include probiotics, buffers, and bloat preventives and treatments such as poloxalene (Therabloat®) and magnesium oxide.

Specific animal health concerns in “naturally raised” programs

1. **Neonatal diarrhea (“calf scours”).** Calf scours is a multifactorial problem that results most often from a combination of: excessive exposure to pathogens in the calf’s environment, inadequate immunity in the calf, and adverse environmental conditions favoring the

organisms’ survival or weakening of the calf’s immune system due to stress. The causative agents of calf scours include viruses such as rotavirus and coronavirus, bacteria such as *E. coli* and *Clostridium perfringens*, and protozoa such as cryptosporidia and coccidiosis. For many of these conditions, such as diarrhea due to viruses or cryptosporidia, antibiotics are of no use in treating the primary infection.

Prevention of calf scours is of great importance and can be aided by attention to the calf’s colostrum antibody intake (influenced by the condition and immune status of the cow), attention to the sanitation of the calving area, and use of preventive antibody supplements when indicated. Specific preventive strategies that should be considered include pre-calving vaccination of the cow herd against scours pathogens (“scour shots”), moving cows that are yet to calve onto clean pastures (the “Sandhills system”), and the use of products such as *C. perfringens* type C antitoxin or First Defense® at or shortly after birth.

2. **Bovine Respiratory Disease Complex (BRDC).** BRDC, another multifactorial condition, is the most economically important disease affecting weaned calves. Factors affecting the expression of BRDC include immune status of the calf, environmental conditions, exposure to novel strains of causative organisms, and stress on the calf—environmental and otherwise.

Because of its importance, BRDC prevention and control take on a primary role in the success of a “naturally raised” program. This prevention starts with proper pre-conditioning, with appropriate vaccines given pre-weaning and again at weaning, and with pre-conditioning of the rumen by introduction of creep feed and breaking to feedbunks.

External stresses and disease exposures should be limited as much as possible. To accomplish this goal, management strategies such as fenceline weaning and limiting the mixing and co-mingling of groups of cattle should be considered. Evidence also exists that testing incoming cattle for persistent infection with BVD virus is an economical method of limiting exposure of purchased cattle to immunosuppressive effects of the virus.

Proper nutrition plays a substantial role in prevention of BRDC, and rations for incoming or weaned calves need to be properly balanced for energy and protein and properly supplemented with trace minerals and vitamins.

3. **Coccidiosis.** Coccidiosis is a diarrheal disease caused by a protozoan. The organism damages the intestinal lining in the course of its reproduction, often resulting in a bloody, mucoid diarrhea. It primarily affects young calves (around 1–2 months of age) or stressed calves in the feedlot (post-weaning or post-weather stress). Risk factors for coccidiosis include cool, moist weather, stress to the calf through weather conditions or co-mingling, and immunosuppression due to parasites or BVD virus infection.

In conventional feeding programs, ionophores and coccidiostats have been successfully employed to control and prevent coccidiosis.

Control without the benefit of these products primarily consists of minimizing stresses to the calves and of paying attention to sanitation of the calves' environment.

4. **Digestive problems.** Rumen bacteria and protozoa are abundant in ruminal fluid and play important roles in proper digestion in the ruminant. These microbes break down forage-based feedstuffs into volatile fatty acids (VFAs), which the calf uses for energy, and then become protein sources themselves as they are digested. In conventional feeding programs, ionophores and antimicrobials play roles in enhancing that conversion and in minimizing certain rumen disorders such as:

- a. **Acidosis.** In the conversion of carbohydrates to VFAs, lactic acid is an intermediate product. Too much lactic acid is the root cause of rumen acidosis; this condition can occur when starches and sugars are more rapidly fermented in the rumen compared to other feedstuffs and rumen pH drops (the rumen fluid becomes more acidic). The net effect of this drop favors bacteria that produce more lactic acid. Lactic acid is a stronger acid than are the VFAs and is more slowly absorbed out of the rumen, so its production results in ever-decreasing rumen pH and an exacerbation of the situation.

Rumen acidosis can be acute, “sub-acute,” or chronic. Acute acidosis occurs after an uncommonly large ingestion of carbohydrates in a short period of time (“grain overload”), and can potentially result in severe symptoms (loss of appetite, diarrhea, rapid or difficult breathing, abdominal pain) or even recumbency and death.

Sub-acute ruminal acidosis (or “SARA”) refers to continual, lower-level rumen acidosis and, as with

chronic acidosis, occurs after longer periods of relatively high carbohydrate intake. Symptoms of sub-acute or chronic acidosis may include decreased feed consumption, diarrhea, weight loss, and laminitis (founder). In addition, acidosis may have detrimental effects on the immune system.

In conventionally raised cattle, ionophores decrease the incidence of acidosis. These compounds act on certain species of rumen microbes, altering the overall population within the rumen to change fermentation patterns. The net result of this alteration is an increase in propionic acid production and a decrease in lactic acid production. Ionophores also cause a moderation in feed intake, which affects the incidence of acidosis.

Since ionophore use in “naturally raised” programs is not normally permitted, nutritional management becomes important in acidosis prevention. Total mixed rations should be utilized. Proper pre-conditioning of calves will ensure that the calves make an even transition onto higher concentrate rations, and rations should be changed gradually so that rumen microbes are able to adapt to the new conditions. Probiotics and buffers may be utilized to aid in prevention of acidosis.

- b. **Bloat.** In cattle, two types of bloat are generally recognized: free gas bloat and frothy (foamy) bloat.

Free gas bloat exists when there is a large gas bubble in the rumen that cannot be eructated (belched out), usually due to a physical or functional obstruction of the rumen or esophagus. It can be treated successfully by decompression with a stomach tube and is not especially prone to reoccurrence.

Frothy bloat is the most common type of bloat encountered in feedlot cattle. It occurs when the rumen contents become so thick and viscous that gas bubbles trapped within the fluid cannot combine and be belched out. There are two root causes of frothy bloat:

1. **Microbe-based frothy bloat** occurs when compounds in the rumen bacteria (polysaccharides) cause the rumen contents to become viscous. Fluctuating rumen pH causes more bacteria to rupture and release the polysaccharides into the rumen. This higher viscosity rumen fluid is more apt to trap gas, causing froth instead of free gas.

2. **Plant-based frothy bloat** occurs when compounds in the diet cause rumen contents to become viscous. Commonly, these dietary compounds are found in legume pastures, barley, wheat, and soybeans. Feed particle size and the rate of change of the diet may contribute to this type of frothy bloat.

Ionophores have been used for bloat prevention in conventionally raised cattle. They alter microbial activity so that lesser amounts of foaming agents are produced.

In the absence of ionophores, surfactants such as Therabloat® (poloxalene) and mineral oil have been used in prevention and treatment of frothy bloat; however, they are generally regarded as useful only for plant-based frothy bloat prevention. Nutritional management, therefore, becomes important in managing bloat; inclusion of higher amounts of long-stemmed hay into the ration is one feeding strategy that has been employed to reduce frothy bloat in feedlot calves.

- c. **Liver abscesses.** Liver abscesses form as a result of rumen acidosis. In such conditions, bacteria such as *Fusobacterium necrophorum* (the bacterium that starts liver abscesses) thrive. Rumen acidosis causes the inner wall of the rumen to become more permeable to those bacteria, which then enter the portal circulation, which runs from the digestive tract to the liver. The bacteria colonize the liver and cause abscesses.

Adverse effects of liver abscesses include decreases in carcass yield, fat thickness, and yield grade. In rare cases, the abscesses may rupture and cause peritonitis (infection of the lining of the abdomen).

Prevention strategies in conventionally fed animals include feeding the antibiotic Tylan that, of course, is not permitted with natural feeding programs.

Therefore, in “naturally raised” programs, control measures for liver abscesses are based on the control of rumen acidosis, as outlined previously. A

vaccine is available that has been shown to reduce the incidence of liver abscesses in cattle being fed high-concentrate diets.

5. **Foot rot.** Foot rot is also caused by *Fusobacterium necrophorum*, often in conjunction with other bacteria. These bacteria are common in mud and manure, and they gain entry into the skin of the foot between the hooves when that skin is disrupted due to abrasion or exposure to a continually moist environment. Treatment of foot rot is difficult at best when antibiotics are not available for use.

Prevention strategies focus primarily on providing a dry environment in the feedlot. Nutritional supplements such as zinc and organic iodine may influence the incidence of foot rot, and a vaccine is available that may provide some protection in certain instances.

Summary

1. Animal health is crucial to the success of a “naturally raised” feeding program.
2. Vaccines are **not** excluded from “naturally raised” programs. On the contrary, they are a key component of preventive medicine in these groups of cattle.
3. Prevention takes on added importance with animal health in “naturally raised” cattle. For infectious diseases such as calf scours, BRDC, and coccidiosis, limiting exposure to the infective agents is the most effective means of prevention.
4. Immunosuppression must be minimized in “naturally raised” cattle. The foremost cause of immunosuppression in cattle is stress due to weather, weaning, processing, and co-mingling. Other significant causes are parasitism and exposure to persistently infected BVD calves.
5. Most “natural” programs require written documentation and verification of herd health protocols and treatments. Producers of “naturally raised” cattle may be asked to sign affidavits and/or agree to audits verifying the “natural” status of the cattle.

A Sample Naturally-Raised Cattle Health Program: From Before Birth to Slaughter:

(Always coordinate your specific program with your veterinarian!!)

1. Pre-calving scours vaccination for dams, as an aid in increasing colostral antibodies delivered to the calf.
2. Calve cows on clean ground.
3. Assure passive transfer of antibodies to newborn calves; use colostrum supplements/replacers, or antibody products if indicated.
4. Use antitoxin products (e.g. *Clostridium perfringens* antitoxin) if conditions require.
5. Consider Vitamin E or B12 injections to weaker baby calves.
6. Pre-turnout (branding) vaccines as conditions require:
 - a. 7-way Clostridial (blackleg)
 - b. +/- Pinkeye vaccine
 - c. +/- 4-way viral vaccine
 - d. +/- Mannheimia (Pasteurella) vaccine
7. Pre-weaning vaccines 2-4 weeks prior to weaning:
 - a. 7-way clostridial (blackleg)
 - b. 4-way viral vaccine
 - c. Mannheimia hemolytica vaccine
8. Booster vaccines at weaning time:
 - a. 4-way viral vaccine
 - b. Consider liver abscess vaccine
9. Consider fenceline weaning as a means to reduce stress.
10. Manage ration changes carefully to reduce incidence of acidosis, bloat, and liver abscesses.

Additional step for purchased cattle:

1. Test incoming calves for BVD persistent infection by taking an ear-notch sample from each calf and submitting it to a veterinary diagnostic laboratory for analysis.

Note: Product brand names, when included, are presented solely for clarification, and do not represent in any way an endorsement of those products.

Reference:

Nagaraja TG, Galyean ML, Cole NA. 1998. Nutrition and disease. *In* Veterinary Clinics of North America Food Animal Practice, Stokka G, ed. 14: 2;257-277.

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