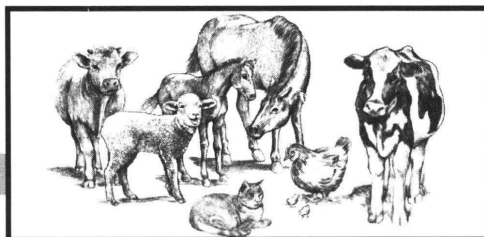


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Feeder and Stocker Health and Management Practices

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Disease represents a major problem in most feeder and stocker settings. In some instances, outbreaks of disease can result in as much as a 30% death loss. In addition, treatment costs, feed efficiency losses, and the expenditures and labor necessary for treatment, as well as the necessity of culling animals which fail to respond to treatment, make disease loss substantial in many situations.

The diseases that most often result in losses center around the respiratory tract, forming what is called Bovine Respiratory Disease Complex (BRDC). This complex is also known as shipping fever. Digestive disturbances — including such diseases as BVD, diarrheal diseases, grain overload, bloat and parasites — represent a second major area of disease loss.

Goals for herd health management in a stocker setting should be centered around the following:

- (1) The reduction of death and culling rates;
- (2) The improvement of feed efficiency;
- (3) The optimization of expenditures for drugs and labor used in treating and preventing disease.

Bovine Respiratory Disease Complex

Bovine respiratory disease complex (BRDC) is often called shipping fever or simply pneumonia. It is a disease characterized by the involvement of a number of agents and tissues, but especially important are viruses that attack the respiratory system. In the final stages, a bacterial pneumonia

often develops and is the objective of most of the treatment; it is almost always the cause of death in cattle with BRDC.

Research on BRDC has indicated that three factors are probably involved in its cause. The first is stress which decreases the animal's ability to fight disease invasion. The second is a group of viral predisposing agents. The third is a bacterial invasion of the lungs, mainly by *Pasteurella hemolytica*, but *Pasteurella multocida* also may be involved. The bacterium *Haemophilus somnus* has also been described as a possible cause.

Stress and Respiratory Disease

The reduction of stress is an important part of any control program. Stress can be caused by anything that abruptly changes the calf's normal relationship with its environment. The tremendous environmental changes that a calf goes through as it is weaned and moved from the cow-herd to the weaning lot, or to a stocker operation are all forms of stress. Specific changes take place in the calf's natural defense mechanisms in response to stress. These changes make it susceptible to infections by bacteria and viruses. A number of specific factors that produce stress in marketed beef calves have been identified:

- 1. Weaning:** This procedure can stress a calf more than any single management procedure. Calves that have been weaned 30 days prior to the purchase will generally have less disease than

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those that are weaned when marketed, since the stress of weaning is separated from the stress of marketing. Such calves are less available to buyers than those that have not been pre-weaned, and they are also generally sold for higher prices.

2. Shipping, sorting, loading, and unloading: All of these procedures result in fear, exhaustion, and reduced resistance to disease. Therefore, cattle that have been shipped shorter distances and have been handled less should be preferred for purchase. Gentle handling in all of these operations becomes important.

3. Abrupt changes in diet: Two factors are involved when considering nutrition of marketed beef calves: 1) Nutrient intake may decrease greatly because calves are not offered feed during marketing or refuse to eat new feeds, and 2) calves may become sick if they are fed too much high energy concentrate too rapidly. Calves and yearlings should be handled differently in terms of nutrition. Calves will typically benefit from a 50:50 concentrate: forage ration for the first few days to assure they consume enough energy. They will generally not over-engage on grain initially. Yearlings that have been on roughage rations should be introduced to concentrate rations slowly since they will tend to over consume grain.

4. Shrink: Shrink refers to the loss in weight that occurs when cattle are handled or shipped. In some instances, as much as 15% of the body weight may be lost. Major losses are due to decreased feed consumption, manure losses, and especially water losses from both the digestive tract and the tissues (dehydration) when cattle do not drink. Studies have shown that the incidence of disease can be closely correlated with shrink. Prevention procedures should include reducing the time between shipment and receiving, and providing cattle access to water.

5. Environmental Stress: Environmental stress may result from heat, dust, mud, humidity, and poor housing conditions. Calves should not be weaned in barns with poor ventilation because of the increased incidence of disease. Purchasing and marketing calves at times when environmental stress can be minimized should be considered.

6. Social Stress: Social stress results from mixing cattle that have not previously been together. This in itself is an important reason to minimize mixing cattle from separate groups as much as possible.

7. Castration and Dehorning: Castration and dehorning are procedures that are quite stressful and should be delayed until calves have gotten over the stresses of weaning and marketing. Some producers and veterinarians feel, however, that the newer banding castration methods produce less stress and can be performed immediately upon arrival.

Infections and Respiratory Disease

Viruses are important in the bovine respiratory disease complex. In general, they play a role by reducing the ability of the immune system of cattle to deal with the bacterial invaders that may result in pneumonia. These viruses and some vaccination considerations are:

1. Infectious Bovine Rhinotracheitis Virus (IBR).

This virus attacks the nasal cavities and windpipe resulting in damage to respiratory tract tissues that protect the lungs. Modified Live (ML) intranasal and intramuscular vaccines, as well as killed vaccines are available. In general, the intranasal vaccine may be the most useful for vaccinating cattle at receiving, since immunity development is rather rapid, 3 to 6 days. Most killed vaccines will require a booster and 2-4 weeks and a booster before protection begins. Modified Live vaccines produce immunity around 7 to 10 days post vaccination.

2. Parainfluenza 3 (PI3). This virus is probably not as important as many of the other viruses in the stocker setting. It is mentioned because PI3 vaccine is often combined with IBR vaccine. Once again, modified-live intranasal, intramuscular and killed vaccines are available.

3. Bovine Respiratory Syncytial Virus (BRSV).

This is another virus that attacks the nasal, windpipe, and lung surfaces. Some evidence suggests that it may be an important initiator of BRDC. Modified live virus vaccines are currently available, and their use may prove helpful. This agent is now commonly included in respiratory vaccines.

4. Bovine Viral Diarrhea (BVD). The BVD virus is probably more important in the stocker setting because of its ability to lower the immunity of cattle. Much controversy has arisen over the exact role of BVD in BRDC. There is also a controversy over modified live BVD vaccination because in some instances vaccination has increased problems. Because of this, cattle that have not been vaccinated sometime prior to weaning and shipment should either be vaccinated with a killed product or should not be vaccinated at all.

A major component of a program to control shipping fever (BRDC) involves the prevention of animal exposure to disease-causing organisms. Most groups of cattle contain individuals that are carriers of disease-causing organisms. Animals in these groups may be immune to these agents, but new animals could be susceptible. Sick animals are also a source of much exposure. Marketing management becomes very important because animals that spend less time in transit experience less disease. Animals purchased directly from the farm have an advantage because of their avoidance of exposure to other animals and to infected pens, feed, and water that occurs as animals are processed through sale yards. Co-mingled lots of cattle, because they come from many different herd sources, are potentially exposed to greater numbers of infectious organisms. Once animals have arrived at the premises, co-mingling lots should be avoided as much as possible. This is particularly true once animals have become established. The addition of new animals to lots that have been received in previous days or weeks often leads to disease outbreaks. Animals that have been purchased in separate lots should be kept separate for at least three weeks if at all possible.

As previously mentioned, bacteria are the ultimate cause of most disease losses in feedlot settings. The *Pasteurella* organisms are by far the most important, but *Haemophilus* organisms may also become involved. Vaccines prepared by killing the *Pasteurella* organisms are called bacterins. They have been available for a number of years and have been used widely; however, research has indicated that these vaccines are of no value, and possibly are damaging in many instances. Therefore, the use of these products should be avoided. Several new

vaccines are available which are called toxoids. These vaccines protect the calves' lungs from the toxin produced by *Pasteurella*. There is good evidence that these vaccines are beneficial if given before the calves are stressed. There is less evidence that giving these relatively expensive vaccines after purchase is cost effective.

Parasite Damage

As mentioned earlier, a major portion of an adequate disease prevention program involves keeping the animals' resistance to disease at a high level. Parasitism markedly reduces the resistance of animals to disease, and results in decreased weight gain in feedlot animals. Internal and external parasites may be involved. Internal parasites are generally divided into two categories. The first are worms (gastrointestinal parasites). As purchased cattle may have been in grazing situations where they were exposed to considerable loads of worms, deworming is generally recommended at the time the cattle are received. An effective substance and dose should be used to assure that any worms that are present may be controlled. Recent discoveries show that some of these parasites (mainly the bovine stomach worms, *O. Ostertagi*) have an inhibited stage during which they may survive treatment by many of the dewormers used in the past. As these worms in the inhibited stage come out of the stomach and intestinal wall during late winter and spring, diarrhea and reduction in weight gain results. The drugs ivermectin, doramectin, moxidectin, albendazole, and oxfendazole are effective in killing these parasites in the inhibited stage.

Coccidiosis is another form of internal parasite that often becomes important in feedlot settings. The coccidia are tiny parasites that attack the large intestine and cause diarrhea which may become bloody and severe enough to result in death. Cattle become infected by ingesting fecal material. This results when feed or water sources are contaminated, or when cattle lick their hair after having lain in either dry or wet manure. Cattle are especially susceptible to coccidia when they are stressed by weaning or marketing. The most important aspect of coccidia control involves sanitation to prevent feed, water and haircoat contamination with manure. In addition, the use of a coccidiostat in starter rations may be indicated. The ionophore feed additives,

especially lasolacid (BovatecR), provide a considerable level of coccidia control along with feed efficiency improvement.

External parasite control is also important. Although it has not been documented that cattle warbles (grubs) cause decreases in gain, it is well known that they are sources of irritation and may damage hides and meat. Therefore, cattle that will be sold for slaughter during the months of March through June should certainly be treated for grubs. Systemic organophosphate treatments are available and are very effective in controlling grubs. Lice also have a great potential for causing weight losses in most settings. This is especially true during the winter months. Systemic lice treatments are available and should be applied during mid-winter to control this problem. Both pyrethroid-type products and the class of dewormers called "endectocides" (ivermectin, doramectin, milbimycin) are quite effective against lice and are available in a variety of forms. Cattle should not be treated for grubs between November 15th and March 1st.

Other Irritants

The prevention of exposure to respiratory tract irritants is also important in keeping the animal's resistance high. Ammonia levels may become very high in buildings that are not properly cleaned and ventilated. Research has shown that noxious fumes from truck exhaust systems cause inflammation of the respiratory tract and increase disease susceptibility. Feedlot operators should insist that calves be delivered in trucks whose exhaust fumes are routed well outside the trailer compartment. Semi-tractors with short-stack exhaust systems should not be used for hauling cattle.

Nutrition

Nutrition plays an important role in maintaining high disease resistance. In general, the newly received calves should be provided with adequate amounts of energy and protein. The prevention of grain overload or rumen acidosis is also very important, as is the provision for rapid rumen adaptation to higher concentrate rations. Rations as high as 50% concentrate will, however, benefit calves who tend to eat so little that low energy often contributes to disease.

When starting calves after arrival, offer calves access to clean drinking water and plenty of high quality, clean grass hay. If corn silage or grain is to be fed, it should be introduced on the second day by sprinkling a small amount on top of the hay. In Canadian studies where cattle were introduced to large quantities of silage initially, a considerably higher incidence of respiratory disease resulted. Therefore, corn silage or grain should be increased gradually, while hay is decreased, over the next week until a desired level of silage or grain is reached.

The addition of low level antibiotics may also be considered in the starting ration. In general, chlortetracyclin, oxytetracycline, neomycin, tylosin, or combinations of these have been used. Most studies have shown an increase in gains and feed efficiency during the first 4-6 weeks. Note: these products will not prevent disease outbreaks, nor are they adequate for the treatment of sick cattle.

Another feed additive that is often given to feeder calves is a coccidiostat (decoquinate or one of the ionophores). The addition of these to rations upon arrival has been documented to increase animal health and gain, as the stresses of marketing tend to predispose cattle to coccidiosis. Great care must be taken to be sure that calves are consuming appropriate levels of these compounds. Typically hand top-dressing of these is recommended until calves are eating predictable amounts of feeds so that mixing them into the ration will assure appropriate doses of these drugs. Decoquinate tends to be tolerated initially better than the ionophore. Some recommend using decoquinate for the first 4 weeks and then continuing with an ionophore.

Feed bunk management is an important consideration for new calves. Bunks should provide plenty of space for all calves, and they should be arranged so that timid calves will not constantly stay away from bunks. Fresh feed should be kept in front of cattle at all times. The quality of feed should be carefully controlled, particularly in receiving rations, and low quality or spoiled feeds should not be used. The length of time that feed may be left in the bunk before becoming stale depends on the moisture content, frequency of feeding, weather conditions, the ration, and the combination of feeds it contains. A general rule would be to provide fresh feed to

calves every 24 hours. Sooner or later, all feed not consumed will become stale and must be discarded. It is not poor management to have the cattle clean up the bunks at least once a day, providing that the cattle are not out of feed to the extent that they become restless or gorge when they are fed again.

Clean, fresh water for cattle is just as essential as fresh feed. When new calves are being encouraged to drink water, the daily cleaning of water containers is recommended.

Another way of maintaining resistance is to prevent vitamin deficiency. Injections of vitamin E and selenium should be considered at the time cattle arrive; this will prevent deficiencies that lower disease resistance and weight gains. Vitamins A & D may also be beneficial for cattle that have been on poor quality hay diets. These injections will only support animal needs for a few weeks so rations must include adequate levels of these nutrients to prevent long-term deficiencies. Vitamin A requirements may be increased during stress. The starter ration should provide 40,000 to 60,000 international units per head per day.

Detecting and Treating Sick Cattle

Early detection of sick animals and their treatment is essential. As little as a 12-hour wait may mean the difference between rapid recovery and a chronically infected or dead calf.

A regular schedule of surveillance and observation for signs of illness must be established and initiated on the day of arrival. The entire group of cattle should be closely observed for signs of illness at least three times a day for a minimum of two weeks. Taking the temperatures of recently received cattle will allow discovery of cattle that are incubating a disease. For temperatures to be meaningful they must be taken during the first 2 hours after daylight and within 40 minutes after handling begins. Cattle with temperatures over 103°F are generally considered to be sick.

It is essential that one person be delegated to observe the cattle and identify those that are to be handled individually. Common signs of illness include body temperature greater than 103°F, drooping of both ears, reluctance to rise, reluctance to move about, failure to come to the feed bunk, a lack of abdominal

fill (gauntness), stiff gait, abnormal discharge from eyes, sunken eyes, dry crusted muzzle, yellow or white discharge from the nose, harsh dry cough, labored breathing, diarrhea, dehydration, and a rough haircoat.

Sick cattle must be treated individually as soon as clinical signs appear. These cattle will not consume adequate antibiotics or sulfas to treat the condition if the drugs are placed in their feed or water. Injections or boluses are most often used for treatment.

Once treatment is initiated, it should be continued for two days past the time when the animal's temperature drops below 103°F. This requires the careful monitoring of temperatures of sick cattle. When large numbers of cattle are becoming ill (if more than 20-30% of the cattle are sick at any one time), treatment of the entire group may be considered, using a long-acting antibiotic treatment.

Preventive antibiotic treatment against respiratory disease of all animals upon arrival is used in some instances. This has become much more popular recently as two antibiotics have been approved for this purpose. They are tilmicosin and florfenicol. The procedure that used to be known as mass medication is now called metaphylaxis. Examples of times when this may be recommended are: (1) when cattle are already becoming ill on arrival at the lot, or (2) when adequate checking of cattle for sickness is not possible. When this is done, an effective antibiotic should be given at full recommended doses. Preventive treatment using these guidelines tends to be a fairly expensive alternative and is only cost effective when a large number of calves is likely to become sick.

Treatment of disease is one area in which the use of a veterinarian can be an exceptionally good investment. The veterinarian should be relied upon to diagnose the problem and to help select the proper drugs, dosages, and treatment schedule. Also, diagnostic tests and necropsies on animals that die are essential to establish an accurate diagnosis and to arrive at effective treatment procedures.

Summary of Arrival Procedures

These procedures are best done upon arrival of the animals or within 24 hours of arrival.

- 1) Vaccinate calves that have not been vaccinated previously (or unknown).
 - a) IBR/PI3, intranasal vaccine.
 - b) 7-way clostridial vaccine.
 - c) Consider Pasteurella toxoid and Haemophilus vaccination.
 - d) If BVD vaccination is indicated, the killed product should be used.
 - e) Consider BRSV vaccine.
- 2) Vitamin injections. Vitamin E and selenium and/or Vitamin A.
- 3) Dose with a dewormer.
- 4) Implant a growth stimulant.
- 5) Ear-tag each calf for identification.
- 6) Practice grub and lice control. Pour-on is best for healthy calves. **Don't use systemic grubicides (Warbex® or Spoton®) between November 1 and February 15.**
- 7) Avoid mixing groups of calves of different origin for at least 3-4 weeks.
- 8) Provide a comfortable area. Calves should not be shut in poorly ventilated buildings. Dry bedding is important.
- 9) Cattle should be examined carefully for illness. If any disease problem is suspected, take temperatures of cattle with a rectal thermometer, remembering normal temperature is 102°F. Generally, cattle with temperatures greater than 103°F can be considered abnormal.

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