



The Veterinary Link

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The value of preconditioning programs

There is strong evidence that bovine respiratory disease (BRD) decreases gain, carcass value and economic return of feedlot cattle. Calves that are weaned, castrated, dehorned, trucked, commingled with new penmates and given a completely new diet when they arrive at a feedlot are at high risk for BRD.

The concept of preconditioning feeder calves was first introduced in the mid-1960s in an effort to prepare calves for the feedlot before they left the farm or ranch of origin. Preconditioning is a theoretically sound concept. Programs with various requirements for vaccine and dewormer use, timing of weaning, timing of castration and dehorning, and exposure to grain-based diets have been developed and promoted by a number of groups and businesses.

However, preconditioned cattle still have inconsistent health benefits once they arrive in feedlots. Numerous factors — such as weather, nutrition, stress and exposure to cattle that shed germs previously not encountered — can affect the health of feedlot cattle regardless of vaccination and weaning management.

A number of factors combine to cause BRD. Interactions between respiratory viruses and bacteria as well as depression of the immune system due to environmental, nutritional or management stress can cause BRD. Environmental stressors include heat or cold stress, dust, and fumes toxic to the lining of the respiratory tract. Dehydration, exhaustion, rough handling and mixing cattle into new social groups are examples of management stressors. Failure to provide adequate water, energy, protein or minerals causes nutritional stress.

Viral infections such as infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), and parainfluenza-3 (PI₃) virus are known to cause damage to the lining of the respiratory tract, which causes inflammation and the development of suitable sites for bacteria to attack the lungs. In general, bacteria do not cause BRD in healthy, unstressed cattle. Immune suppression and damage to the lining of the lungs are required for bacteria to invade the lungs and cause pneumonia.

Mannheimia haemolytica is the most commonly isolated bacteria in cattle that die from BRD. *Pasteurella multocida* is also isolated from fatal BRD cases, especially in younger cattle. Both of these bacteria are found normally in the upper respiratory tract and are able to invade the lungs only if defense mechanisms break down.

Preconditioning programs aim to reduce the number of stressful situations that a feeder calf has to deal with as it is moved from the ranch of origin to the

feedlot. Trucking and exposure to new animals is unavoidable in most situations, but other known stresses can be managed. Castration and dehorning have been shown to severely decrease feed intake and gain and increase the risk of disease when done at the feedlot. If these stresses can be done earlier in life (younger than 4 months of age), the negative effects are greatly reduced.

Rapid adaptation to a grain-based diet and good feed intake soon after arrival in a feedlot are associated with cattle that don't develop BRD. In the late 1980s, scientists at Oklahoma State University and Utah State University suggested that rapid acceptance of a feedlot ration depends more on recognition of the diet than on whether the rumen has adapted to the new diet. Regardless of the specific benefit, most preconditioning programs require a period of exposure to a grain-based diet, with or without weaning.

Because viral diseases such as IBR and BVD are associated with BRD, vaccination programs to decrease the risk of infection are key components of preconditioning programs. The immune system requires two to three weeks to reach optimal function after the vaccination protocol. Inadequate nutrition, including deficiencies of protein and micronutrients such as copper (Cu) and zinc (Zn), will restrict immune responses. Herds under stress due to transportation, weather, disease or other environmental stressors are poor subjects for immunization because the immune response will be diminished.

In dollars and cents

Data from 1,576 lots of calves sold through seven Superior Livestock Auction video sales in 1995 indicated that the mean adjusted sale price of calves that had received preweaning vaccinations and had been weaned 30 or 45 days prior to sale was \$1.35 and \$2.47 per hundredweight (cwt.) higher, respectively, compared to calves that were not in a value-added health program prior to sale. Because income includes not only the price received, but also the total weight sold, producers considering a preconditioning program should consider the issues of cost of weight gain and value of weight gain.

Some cow-calf producers background or graze weaned calves anywhere from 30 days to six months before selling them. Before determining the economic risks and rewards of such a program, several factors, including the marketing method and timing, cyclical market fluctuations, fixed costs (overhead), variable costs (primarily feed), and the goals of the producer, should be considered.

Work done at the University of

Missouri with cow-calf producers raising both spring-born and fall-born herds that utilized a short (61- to 81-day) postweaning growing period showed that economic return was positively correlated most strongly with body weight at the time of sale. Return was moderately positively correlated with average daily gain (ADG) during the growing period. Cattle that benefited economically from the postweaning growing period had higher ADG than cattle that would have been sold at weaning. However, postweaning ADG could not be predicted based on weight or condition at the time of weaning.

Many cow-calf producers are reluctant to retain ownership of calves during the postweaning bawling period. Instead, they prefer to sell calves the day of weaning. This may be due to lack of facilities and/or labor necessary to keep weaned calves on the farm, or from a reluctance to bear the health risks for postweaning calves.

In some areas of the country, raised or local feedstuffs are not available at a

price that allows low cost of gain. And, some producers do not anticipate a price reward for preconditioning that will offset their expenses. These obstacles are legitimate reasons that some producers should not precondition their calves. To overcome these obstacles, producers must be able to utilize cost-effective weaning, working and feeding facilities; obtain feed at a competitive cost; grow the calves at a high enough rate of gain to allow a low cost of gain; and sell the calves in marketing channels and to buyers that reward preconditioning.

Optimize preconditioning

The value of healthy feeder calves that will stay healthy in the feedlot is well-established. Participation in preconditioning programs is assumed to improve feedlot cattle health because known disease risk factors such as castration and dehorning at feedlot arrival, low feed intake early in the feeding period, and infection with viral diseases such as IBR and BVD are addressed.

Cow-calf producers are likely to maximize the benefits of a preconditioning program if they can integrate a preconditioning program into a strategy that optimizes calving season, weaning date, cost of gain during a postweaning growing period, sale date, capture of health and growth performance data in the feedlot, and a marketing plan to target buyers that value their product.

