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"Stocker Cents" article

Nutrition Considerations for Stressed Calves

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Stress places demands on the bodies of calves that can result in performance losses. Common stresses on young cattle include weaning, cattle handling and hauling, feed and water deprivation during the marketing process, exposure to temperature or weather extremes, and processing practices such as dehorning, castration, and vaccination. Crowding and disease exposure are additional stressors often associated with comingling of feeder calves. Drought is an example of other conditions that contribute to factors causing stress on growing cattle.

Nutrition and stress are closely associated. Nutritional deficiencies such as protein or energy deficiencies can stress calves. Likewise, environmental stressors can produce or intensify nutritional deficiencies. Stocker cattle operators should consider practices to minimize stresses on calves and methods of coping with the effects of stress on calves. This article highlights many of the recommendations the National Research Council reports for stressed calf nutritional programs.

Rumen fermentation involves microorganisms such as rumen bacteria, protozoa, and fungi. This process is a critical part of the digestion and utilization of feedstuffs in stocker calves. Newly arrived calves to a stocker operation have likely undergone periods without feed and water during the course of marketing and shipping. Rumen fermentation processes and capacity are decreased by feed and water deprivation and remain depressed for a few days after calves regain access to feed and water. Rumen microorganism levels drop sharply after calves are stressed. When transportation stress is added to the stress from feed deprivation, longer recovery periods are needed for rumen microorganism levels to return to normal. These ruminal changes result in decrease calf appetite and feed intake.

One of the most challenging management problems resulting from stress on calves is lowered feed intake. Feed intake decreases by over 50% in calves experiencing respiratory disease and fever. It is often difficult to meet nutrient requirements in calves suffering from bovine respiratory disease complex due to the dramatic reductions in feed consumption. It sometimes takes up to two weeks for calves to resume normal feed intake levels after the start of respiratory disease. Low feed intake is of particular concern when using medicated feed additives requiring adequate intake of medication for effectiveness against conditions such as coccidiosis.

While protein and mineral requirements of stressed calves may not differ from non-stressed calves, protein and mineral supplementation levels may need to be increased with stressed calves to compensate for reduced feed intake. Increasing diet nutrient density helps supply adequate nutrient levels when feed intake is depressed. Receiving diets for lightweight, stressed calves should target 13.5% to 14.5% protein on a dry

matter basis to meet protein requirements. In cases of severe intake depression, dietary dry matter protein levels may need to approach as high as 24% crude protein.

Much of the shrink or weight loss common with calf marketing, shipping, and processing is water loss. Longer transits only increase weight loss and calf stress. Bodily water losses can increase mineral losses from the body and, combined with low feed intakes, lead to mineral deficiencies. Nutritional programs for stressed calves should include 1.2% to 1.4% potassium in the diet for two weeks after arrival in cases where shrink exceeds 7%. Additionally, high concentrations of zinc have been shown to provide benefits to calves suffering from illness. Suggested zinc concentrations for stressed calves are 75 to 100 parts per million (ppm) of dietary dry matter. Vitamin E and selenium are also involved in immune function. During the receiving period, vitamin E should be fed at levels between 400 to 500 IU (International Units) per head per day. Later at least 100 IU of vitamin E with 0.1 ppm Se per head per day should be provided. Supplementation of B vitamins, for instance, niacin, has also been shown to improve response of stressed calves. Daily niacin supplementation of 125 ppm for healthy calves and 250 ppm for sick calves can be beneficial.

Problems in calves can occur when diet energy content is either too high or too low. Low energy diets may reduce immune function. High energy diets can also contribute to health problems, but hay supplementation of high energy diets for three to seven days can alleviate these problems. Hay offered to calves should be good quality grass hay.

Stressed calves have a very low tolerance for fat in the diet. Receiving diet fat content should not go over 4% of the dietary dry matter. Commonly utilized feedstuffs containing relatively high fat levels include whole cottonseed, dried distillers grains, and rice bran, unless it has been defatted. Reduced feed intake and scours can be expected with excessive fat supplementation of calves.

Some nutrient sources (feedstuffs) are better for stressed calves than others. Stressed calves do not respond to non-protein nitrogen (urea) in the diet as well as non-stressed calves. There are some suggestions that increasing rumen bypass protein supplies can increase performance of stressed calves, but research results are mixed. Soybean meal is generally considered a much better source of rumen bypass protein than cottonseed meal. Heat-damaged feeds should be avoided for stressed calves as they may have reduced levels of protein available for the animals to utilize. Another feed-related factor to consider when receiving stocker calves is that dry feeds are often preferred by newly arrived calves over wet feeds such as silages. However, calves will adapt to high levels of high moisture feeds like corn silage in one to two weeks.

Good management can help newly arrived calves to get on feed as quickly as possible. Calves initially walk the boundaries of their new pens searching for a way to escape. Placement of feed bunks and water troughs along the fence lines of receiving pens as opposed to in the center of the pens will increase the frequency of the calves walking past the bunks and troughs. Adequate bunk or trough space is another important consideration in receiving pens. Timid calves may not receive adequate shares of feeds if bunk space is limiting. At least 12 linear inches of bunk space per head is recommended for incoming cattle. Feed and water troughs should be cleaned prior to calf arrival and then closely monitored. Fines or chunks of caked or damaged feed

should be removed from feed supplies offered to calves. Finally, diet changes should be implemented gradually after receiving.

Young, growing calves are one of the most challenging classes of cattle for which to plan nutritional programs. Planning for stressed calves is a task that is even more critical. For more information on stocker cattle production, beef cattle nutrition or related topics, contact an office of the Mississippi State University Extension Service.