

SEAWEED (*Ascophyllum nodosum*) SUPPLEMENTATION FOR BACKGROUNDING WEANLING OR PURCHASED CALVES

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ABSTRACT: TASCOTM-Forage has been effective in increasing immune function in cattle when either applied to tall fescue pasture grazed by steers or by direct ingestion by cattle. Ability to boost immune function prior to an anticipated stress such as weaning and shipping could have far reaching effects on reducing morbidity and mortality of calves. Additional benefits would include less labor and facilities to handle sick cattle, decreased needs for antibiotics and other medications, improvement of carcass characteristics and grade at slaughter, and an extended shelf-life of the cuts during retail display. Previous research has suggested that introducing seaweed into the diet prior to an anticipated stress should position the animal to better tolerate stress and disease challenges but this needs to be tested. Thus, we propose to feed a supplement that provides steers with a feed that provides 0.25 lb of seaweed/day and an equal amount of feed without seaweed, prior to transportation to wheat pastures and eventual finishing in western feed-yards. The overall objective of this study is to determine if TASCOTM can improve health and reduce morbidity and mortality in beef calves shipped from southeastern pastures to the west. We have determined that calves consuming seaweed prior to shipment have less sickness after shipping, than calves not consuming seaweed. However, consumption of TASCOTM by steers under shipping stress, appeared to cause them to exhibit more sickness (elevated temperatures) than untreated calves. There was no difference in grazing average daily gain (ADG) or feedlot ADG in either year of the study. In 2000, calves that had consumed seaweed prior to shipment from grazing to the feedlot had less shrink (5.0 lb/calf) upon arrival at the feedlot, however, these results were not statistically significant. Results from the 2000 study indicate that steers fed seaweed meal yielded display case primal cuts that maintained a cherry red color longer (P<0.07), had greater uniformity (P<0.02) and had less discoloration (P<0.03) and browning (P<0.02) for up to 21 days post harvest than did untreated controls. Results from the 2000-2001 feedlot and shelf life study are being gathered and compiled at this time.

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MATERIALS AND METHODS: One hundred steer calves of Angus, Hereford or Brahman (no more than ¼ Brahman) breeding and weighing between 450-550 lb were divided by weight and breed into four 25 steer groups. Two groups were given a feed containing TASCOTM and two control groups were given an identical feed without TASCOTM. Steers were given 8.0 lb/ day of this complete mixed ration that was formulated as to provide either 0 or 0.25 lb of seaweed meal per day during the 14 days prior to weaning at the Mississippi State University, Prairie Research Unit and the same feed formulation was fed in Texas.. On the day that the calves were weaned, they were shipped to Texas for grazing wheat pasture or placement into a feedlot.. Upon arrival in Texas, each treatment group was divided again. These groups received either 0 or 0.25 lb of seaweed meal per day for 14 days prior being to being placed on pasture or moved to a feedlot. In this design, one-fourth of the calves received TASCOTM for 28 days, 14 days prior to shipment and for 14 days post-shipment, one-fourth 14 days pre-shipment, one-fourth 14 days post-shipment and one-fourth received no TASCOTM. A complete health record was maintained on all calves, which included treatment schedules and medications. Body temperatures were taken upon arrival in Texas and on day 14 after arrival, when they were either turned out to pasture or reloaded onto truck and shipped to a feedlot. Blood samples drawn just prior to loading for shipment to Texas and upon arrival in Texas and on day 14 after arrival. These blood samples were drawn to determine if ingestion of TASCOTM positively effects immune function, as was seen when a seaweed extract that was sprayed on pastures.. At slaughter, carcass characteristics were evaluated and selected cuts of meat were retained to determine shelf life and sensory characteristics.

RESULTS AND DISCUSSION: Upon arrival in Texas, in both years of the study, the body temperatures of the TASC0 steers were slightly higher than the control steers. When the temperatures were taken 14 days later, the temperatures were reversed. On day 14, the steers that had consumed TASC0 both before and after shipment had the lowest temperature, the pre-shipment the next lowest, the post treatment next and the untreated controls the highest. There was no mortality and little sickness from shipping related disease in either year. This may be in part due to an aggressive pre-shipment preventive health program. Preliminary indications are that an enhancement of immune response can be measured with the inclusion of TASC0 in the feed ration. Values determined for immune function were identical to the pattern seen in the day 14 temperatures, pre and post shipment supplementation highest to the lowest immune response in the untreated controls. It appears that the treated steers are getting over the shipping stress by day 14, as indicated by the lower temperatures, while the untreated animals are not. This may be due to the antioxidants present in the seaweed and(or) the heightened antibody titer indicated in the treated steers.

In 2000 when the calves were moved from grazing to the feedlot, treated calves experienced less shrink (5 lb/steer) than did control animals. Due to the small numbers the weight difference was not significant but additional numbers may yield significance. These weights may not be statistically significantly different but 5 or 10 pounds per calf, on a hundred-calf load, certainly makes these numbers financially significant. Due to drought conditions present in the fall of 2000, no grazing was available for the 2001 trial, so this shrink measurement could not be repeated. There was no difference in ADG in either the grazing or feedlot phase in either year..

In 2000, shelf-life data indicated that prime cuts from seaweed treated steers maintained a cherry red color longer ($P<0.07$), maintained greater color uniformity ($P<0.02$) and had less discoloration ($P<0.03$) and browning ($P<0.02$) up to 21 days post harvest. The data for 2001 are being gathered and compiled and available in early 2002. Longer shelf life is significant to the retailer since cuts that oxidize and are not cherry red are generally reduced in price. The eating quality and safety of the cut is not compromised, but the decreased visual appeal makes it less likely to be purchased by consumers.

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