

bulls which under went unilateral castration were included. Data collected included signalment, history, physical examination, ultrasonography, semen analysis, surgery, histopathology, microbial culture, complications and follow-up information.

### Results and Conclusions

The study included 20 bulls, of which 10 were Holstein, 2 Simmental, 2 Hereford, 2 Limousin, 1 Angus, 1 Shorthorn, 1 Salers, and 1 Maine Anjou. The bulls ranged from 1 to 7 years old. The group included sixteen bulls with a history of scrotal swelling and 4 bulls with poor semen quality or asymmetrical testicles. Duration of clinical signs ranged from 1 to 365 days. Palpation of external genitalia revealed unilateral scrotal swelling in 15 bulls, bilateral scrotal swelling in 1, presence of an inguinal hernia in 5, and pain on palpation in four. Epididymal abnormalities were present in three bulls, and 3 had testicles that were not movable. Ultrasonography revealed fluid in the testicular parenchyma in 8 bulls, hyperechoic tissue surrounding the testicle in 7, fluid surrounding the testicle in 6, hyperechoic tissue within the testicle in 3, cystic structures within the testicle in 3 epididymal enlargement in 3, and bowel loops within the spermatic cord in 3 bulls. Two bulls also had abnormalities in the contralateral testicle.

Unilateral castration was performed under general anesthesia in 13 bulls and local anesthesia, with or without sedation, in 7. Complete closure of the scrotal skin was performed in 11 bulls and partial closure was performed in 9 bulls. Histopathologic examination was done on 15 testicles and found tubular atrophy (n=6), interstitial orchitis (n=5), epididymitis (n=3), epididymal fibrosis (n=2), lymphosarcoma (n=1), sertoli cell tumor (n=1), epididymal sperm granuloma (n=1), hemorrhage with necrosis (n=1), and granulation tissue (n=1). Microbial culture yielded *Escherichia coli*, *Enterococcus fecalis*, and coagulase-negative *Staphylococcus* sp in 1 bull each. Excessive scrotal swelling was observed in 14 bulls after surgery. Of these 2 bulls had the incision dehiscence and 5 had the incision re-opened. Follow-up data was available for 5 natural service and 5 semen collection bulls. All natural service bulls had satisfactory breeding ratios, bulls returned to 72% of their sperm cell output before onset of disease.

### Conclusion

Based on the results of this study, sperm cell output after unilateral castration is expected to return to sufficient concentrations to allow continued profitable use of these bulls in semen collection centers.

## New Mutations in Beef Cattle

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Mutation rates are estimated in the range of  $10^4$  -  $10^6$  per generation. This suggests that mutations recur at regular intervals, and inherited phenotypes are likely to emerge or recur in unique breeding populations. In spite of these probabilities, recurrent mutations are not often documented. Syndactyly is a recent example of two mutations that emerged independently in Holstein and Angus cattle. In syndactyly, cattle are born with fused claws. Crossbreeding trials demonstrated the mutation to be allelic but the phenotypes are distinct, suggesting unique mutations.

During the 1999 calving season, two new mutations were reported to the Nebraska Bovine Congenital Disease Investigation Program. Tibial hemimelia was recognized simultaneously in Shorthorn calves from one Canadian and two Nebraska herds. The six calves were from three herds, and traced to a common ancestral sire paternally and maternally within six generations. Pedigrees demonstrated a mechanism by which a recessive allele, identical by descent, could be occurring in a homozygous state and be responsible for the disorder. The lesions: missing patella, shortened or missing tibia,

malformed distal femur, severe abdominal hernia, retained testicles, and meningocele are similar to previous reports of the condition in Galloway calves. This appears to be recurrence of the mutation. Minor differences in phenotype between breeds suggest the mutation is unique, or perhaps that different modifying genes are present in the two cattle populations. Affected calves were born live, but died or were destroyed within a few days of birth.

The second mutation was a dominant mutation in 6 female and 7 male calves of 21 offspring of an Angus bull. Parentage in this multiple bull pasture was verified using 11 microsatellite loci. Calves were born with joint laxity and bone fragility. Calves walked on the backs of the pasterns and the majority of calves developed tibial fractures by 6 months of age. Segregation ratio was consistent with an autosomal dominant mutation. Studies

to characterize the mutation remain in progress. The joint laxity was similar to bovine marfans. However, no lens abnormalities were seen and the bone fragility is not described with that syndrome. Fibrillin was normal in these calves and a collagen defect is suspected.

## References

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# Influence of Seaweed Extract-treated Tall Fescue on Bovine Antioxidant Activity, Immune Response, and Carcass Characteristics

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## Introduction

It has been well documented that tall fescue (*Festuca arundinacea*<sup>a</sup>) infected with the endophyte fungus *Neotyphodium coenophialum*<sup>b</sup> is associated with production and health problems in beef cattle. Various approaches to overcome the negative, animal-related effects of the endophyte have been investigated without consistent and/or economically feasible outcome. This multi-location study investigated effects of applying Tasco™ Forage, a proprietary seaweed-based product, to endophyte-infected fescue to improve animal health and production.

## Materials and Methods

During a 2-yr period at VA<sup>c</sup> and MS<sup>d</sup> were grazed from April through September or October. Tasco™ was applied (3.4 kg/ha) to endophyte-infected (E+) and endo-

phyte-free (E-) fescue pastures in April and July in a 2 X 2 factorial arrangement of treatments. Each treatment was repeated twice. Pasture was the experimental unit. Monthly body weight and haircoat condition scores were recorded. Select immune cell function tests were performed and serum vitamin and trace mineral concentrations measured, in April, July and September/October. At the termination of grazing all steers were shipped to Texas for feedlot finishing on a common diet. Identical immunological and antioxidant parameters were measured on days 1, 14, 28, and the end of the finishing period. Cattle were slaughtered and carcasses evaluated.

## Results and Conclusions

During the grazing period, E+ steers exhibited a decreased ( $P < .05$ ) monocyte phagocytic activity and MHC class II expression, which was reversed by Tasco™ treatment to E+ pastures. Presence of endophyte resulted