Effect of Housing System and Nutrition on Claw Horn Growth and Abrasion in Beef Steers

O. Becvar, *DVM*[1]; **W. S. Swecker, Jr.,** *DVM, PhD*[1]; **D.L. Ward,** *PhD*[1]; **G. Scaglia,** *PhD*[1]; **J. P. S. Neel,** *PhD* [2]; **J. P. Fontenot,** *PhD*[1]
[1] *Virginia Polytechnic Institute and State University, Blacksburg, VA*
[2] *USDA/ARS, Beaver, WV*

Introduction

Lameness results in economic losses in cattle populations worldwide. Most lameness lesions are associated with the lower foot, especially the claw. Major risk factors for lesions of the claw are high grain rations and concrete flooring.

Materials and Methods

The objective of the study was to evaluate hoof growth, abrasion and sole surface area of Angus-crossbred steers grazing pasture or in confinement. Seventy-two yearlings steers (832 ± 13.6 lb; 378 ± 6.2 kg) were allotted to two finishing systems: Feedlot steers were feed a predominant corn grain/corn silage ration and were housed in pens with concrete floors; steers assigned to pasture were rotationally stocked on mixed- grass pastures. The study began in April 2004 and continued until the steers achieved acceptable harvest weight in September 2004. Claw measurements were obtained from both medial and lateral claws of the left rear foot on days 0, 56 and 136. Data were analyzed with repeated measures analyses of variance using a mixed effects model.

Results

Horn growth of the dorsal wall was greater (P=0.0005) in feedlot steers (15.0 ± 0.8 mm) compared to steers on pasture (10.8 ± 0.8 mm). Claw horn abrasion was greater (P<0.0001) in feedlot steers (11.8 ± 0.4 mm) than in steers on the pasture (5.1 ± 0.4 mm). Steers in the feedlot had smaller claw surface area (lateral 3478.1 ± 469.7mm2, medial 2869.8 ± 438.8 mm2) than on pasture (lateral 3660.5 ± 406.5 mm2, medial 3110.7 ± 465.3 mm2). In both environments, medial claws had less (P<0.0001) surface area than lateral claws.

Significance

Steers in confinement on concrete floors fed a corn-grain/corn silage ration had faster horn growth and abrasion rates, yet smaller sole surface area compared to steers grazing pasture. This preliminary study revealed differential biomechanical responses of a bovine foot in the different environments. The design of appropriate management and preventive programs to minimize lameness and promote cattle well-being depends on prediction of claw growth dynamics relative to the ration and environment.

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