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H.J. Davidson

Gerald L. Stokka

Tom Taul

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Prevalence of ocular lesions in cattle from a Kansas sale barn

Abstract

This cross-sectional evaluation of cattle from a sale barn was completed to identify the prevalence of ocular lesions. A total of 100 cattle (91 cows and 9 bulls) was examined as they were being processed through a Kansas sale barn. Ocular lesions were found in 47%. The most frequently identified lesions were corneal scars, found in 26%. Although the exact cause of the scars could not be determined, they were similar in appearance to scars caused by infectious bovine keratoconjunctivitis (IBK) or pinkeye. The second most common lesion was squamous cell carcinoma (SCC), identified in 14%. Cataracts were identified in 7%. A white, raised, proliferative, optic nerve mass was identified in 11%. This high prevalence of eye lesions suggests that cattle frequently suffer from ocular disease or trauma. These lesions can be missed easily if the eye is not evaluated specifically during physical examination.

Keywords

Cattlemen's Day, 1999; Kansas Agricultural Experiment Station contribution; no. 99-339-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 831; Beef; Eye; Ocular; Squamous cell carcinoma; Infectious keratoconjunctivitis; Cataract

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PREVALENCE OF OCULAR LESIONS IN CATTLE FROM A KANSAS SALE BARN

H. J. Davidson¹, G. L. Stokka, T. B. Taul²

Summary

This cross-sectional evaluation of cattle from a sale barn was completed to identify the prevalence of ocular lesions. A total of 100 cattle (91 cows and 9 bulls) was examined as they were being processed through a Kansas sale barn. Ocular lesions were found in 47%. The most frequently identified lesions were corneal scars, found in 26%. Although the exact cause of the scars could not be determined, they were similar in appearance to scars caused by infectious bovine keratoconjunctivitis (IBK) or pinkeye. The second most common lesion was squamous cell carcinoma (SCC), identified in 14%. Cataracts were identified in 7%. A white, raised, proliferative, optic nerve mass was identified in 11%. This high prevalence of eye lesions suggests that cattle frequently suffer from ocular disease or trauma. These lesions can be missed easily if the eye is not evaluated specifically during physical examination.

(Key Words: Eye, Ocular, Squamous Cell Carcinoma, Infectious Keratoconjunctivitis, Cataract.)

Introduction

Eye diseases frequently are overlooked when examining cattle, yet they can cause severe problems. Revenue loss from eye problems is difficult to measure. Ocular lesions can result in increased production costs from medical treatments and in additional animal handling. Income also is lost from reduced weight gain,

reduced milk production, and a reduction in animal value because of eye disfigurement.

Experimental Procedures

The cattle in our study were selected randomly from those being processed at a Kansas sale barn. Examinations were completed during two different seasons (spring and fall) over 4 different days. Cattle in this study were examined by the attending veterinarian and were judged to be in good health. The reason for sale of the individual animals was unknown to the ophthalmic examiner. Animals ranged in age from 1 to 6 years, and included 91 females and 9 males. The cattle breeds included: Charlois (1), Simmental and Simmental crossbreds (17), Hereford and Hereford crossbreds (23), Angus and Angus crossbreds (39), Saler (1), Ayrshire (1), Shorthorn and Shorthorn crossbreds (4), Holstein (9), Gelbvieh and Gelbvieh crossbreds (2), Limousin crossbreds (1), Tarentaise (1), and Chianina (1).

Animals were restrained with a standard hydraulic chute, and nose tongs were used to manipulate the head. Eyes were examined using a penlight to evaluate the entire globe and pupillary light reflexes, a slit-lamp biomicroscope to look closely at the iris and lens, and indirect ophthalmoscopy to evaluate the retina. Vision was accessed by observing cattle in the processing area and by the menace response. The entire eye was examined to include the top, bottom, and

¹Department of Clinical Sciences.

²Attending veterinarian, Manhattan Commission Co.

third eyelids; conjunctiva; sclera; cornea; iris; lens; and retina.

Results and Discussion

The average age of the cattle could not be determined; no age records were available, and some animals were simply assessed to be greater than 6 years of age. A total of 86 abnormalities were found in the 200 eyes examined. Fifty-three animals were normal, 27 had unilateral lesions, and 20 had bilateral lesions. Multiple problems were present in several eyes. Five animals were blind in one eye, but no animal was completely blind.

The most common eyelid abnormality was squamous cell carcinoma (SCC), with the most common location being the third eyelid. SCC of the eyelids was identified in 11 animals; 3 were bilateral and 8 were unilateral. The tumors were raised, white to pink, irregular, tissue masses. Other eyelid lesions included one wart on the top eyelid and one eyelid laceration.

The most common corneal lesion was a scar. Corneal scars were found in 32 eyes of 26 animals. Scars were not broken down into specific descriptive categories. The majority were located in the central cornea. They appeared as white, lacy opacities in the superficial stroma. Active or inactive superficial corneal blood vessels occurred in many scars. In one eye, the cornea was so scarred that further examination of the internal structures was not possible.

The second most common corneal lesion was SCC at the limbus (junction of the cornea and sclera). This was seen most frequently at the lateral limbus, or outside edge. The lesion appeared as a raised white plaque, which ranged in diameter from less than 0.5 cm to 1.5 cm. One cow had a corneal ulcer associated with a large eyelid SCC that was rubbing on the corneal surface. Three animals had concurrent corneal scars and SCC. In two of these animals, the scar appeared to be a healed ulcer that was most likely caused by the mass rubbing on the corneal surface. One cow had bilateral central corneal scars that were unassociated with the lateral limbal

SCC. Another cow had bilateral corneal opacities that were caused by persistent pupillary membranes adhering to the inner surface of the cornea. The overall prevalence of SCC was 14%.

Eleven abnormalities involved the anterior portion of the inner structures of the eye. One cow had bilateral persistent pupillary membranes that extended from the iris to the inner corneal surface. One cow had a portion of the iris stuck to the lens, which had resulted in a cataract. A third cow had a unilateral iris cyst, and a fourth had a misshapen pupil that resulted in multiple pupillary openings. Unilateral cataracts (lens opacity) were identified in 7 eyes. Two of the cataracts were complete and resulted in blindness. In one case of cataracts, an associated shifting of the lens position was observed. One eye that had an incomplete cataract also had a detached retina.

Only a few retinal abnormalities were noted. A single cow had a unilateral retinal detachment. In 11 animals, a lesion was found on the optic nerve. In 7 animals, the lesion was unilateral, and in 4 it was bilateral. The lesion was a raised, white, proliferative appearing mass. The retinal blood vessels could be seen to travel over the top or through the mass. The vessels appeared to be normal, and no identifiable abnormalities of the surrounding fundus were seen. The affected cattle appeared to have normal vision.

Although the literature has numerous descriptions of specific lesions, only one report describes lesion prevalence. The study of Brown Swiss cattle conducted in 1931 reported a total incidence of ocular lesions of 18.8%. Cattle less than 6 years old had an incidence of 3%, and animals between 7 and 14 years of age had an incidence of 43%. No description of the type of ocular lesion could be found. In a retrospective study of ocular disease in llamas, data were collected using the medical diagnosis information from the Veterinary Medical Database. That database collects information from multiple academic institutions. In the llama study, the number of ocular lesions in

cattle was included for comparison. Ocular lesions were reported in 3% of all cattle presented for examination at veterinary teaching hospitals. The reported prevalence of ocular disease is extremely dependent on the method of data collection. In the retrospective study, only the medical diagnosis information was included. Neither the record nor the actual animal was examined. It is uncommon for cattle eyes to be examined during routine health inspections. If lesions are not large enough to be obvious, or the eyes are not specifically evaluated, lesions may be missed, which would give a falsely low estimation of their true prevalence.

In our study, 47% of the animals had eye lesions. That prevalence was based on the presence of any ocular lesion, regardless of whether the animal had unilateral or bilateral lesions or the number of lesions per eye. In cattle 6 years of age or older, the prevalence was 69%. In cattle 5 years of age or younger, the prevalence was 24%. Our data did not provide enough information on any one breed to report prevalence by breed alone, and too few males were examined to determine the prevalence in males versus females.

In Kansas, the two most common clinical ocular problems in cattle are infectious bovine keratoconjunctivitis (IBK) or pinkeye, and SCC. Our data reaffirm that these two conditions are widespread in our cattle population. Corneal lesions that are typical of either IBK or trauma were found at a prevalence

of 26%. SCC, whether on the eyelids or globe, was found at a prevalence of 14%.

Cataracts were found at a prevalence of 7%, and they were all unilateral. Cataracts have been reported to be genetic in some of the breeds in this study. However, the appearance of the cataract and the fact that each was unilateral suggests that trauma or previous ocular inflammation caused them.

The optic nerve lesion seen in 11 cows could not be classified as to physical structure, because histopathology was not completed. This lesion has been noted previously in the veterinary literature but has never been histologically described or associated with any form of systemic disease. The white, raised, proliferative mass did not appear to be a clinical problem, because the animals had sight and did not appear to be in pain.

The high prevalence of ocular lesions, the majority involving the cornea, suggests that cattle suffer from ocular disease or trauma much more frequently than is diagnosed by veterinarians. Producers often estimate the incidence of ocular disease in their herds, but there is little hard evidence to support such estimations. The exact type of ocular disease that results in the lesions reported here needs to be evaluated during the active disease process. Our data suggest that ocular disease is an underdiagnosed and undertreated condition in cattle.