# Chlamydial Proteins Found in Bovine Conjunctival Biopsies

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**Summary**

Bovine infectious keratoconjunctivitis, commonly known as pinkeye, is estimated to occur in nearly half of all herds in the United States and affects at least 3% of all beef cattle[1]. Pinkeye has several etiologies and predisposing factors. *Moraxella bovis* is considered to be the most prevalent bacterial cause of pinkeye and infectious bovine rhinotracheitis is one of the more common viruses incriminated. Advenoviruses [2], mycoplasma[3,4], Brahamella (Neisseria)[5], Listeria[6], and Rickettsia[7] have also been recovered from clinical cases of pinkeye. Neisseria is reported to be a factor only if the cornea or conjunctiva is already injured or infected by other agents[7]. Rickettsaia will only produce this condition if injected into the anterior chamber of the eye[7]. Chlamydia has been found in the conjunctivae of sheep in some outbreaks of pinkeye and is reported to be spread by contact[8]. In a study in Czechoslovakia, Dyml[9] isolated chlamydia from conjunctival scrappings of a bovine animal showing signs of pinkeye[6]. It has been shown that if psittacoid bodies are placed on the conjunctiva of susceptible cattle, acute conjunctivitis occurs[6]. Also, when material from infected eyes of cattle was placed on the conjunctiva of uninfected animals, the majority became infected. However, if this material was cultured on special bacteriological media that is required for the growth of *Moraxella bovis* and placed on the conjunctiva of uninfected animals, considerably fewer cattle develop pinkeye[6].

Because of the chronic or reoccurring lesions in some pinkeye cases and the lack of a definitive diagnosis, some producers and veterinarians have asked about chlamydia as a possible etiology. Laboratory attempts to identify the causative agent are often disappointing at best. Also, chlamydia is not routinely investigated in bovine eye problems. Chlamydia (being an obligate intracellular bacteria) requires biopsies, scrappings, or swabs containing epithelial cells for proper testing. To evaluate the possibility of chlamydia involvement in bovine pinkeye, veterinary practices in each of the four corners and central Kansas were requested to send conjunctival biopsy samples from pinkeye cases. A total of 47 samples from cattle showing clinical signs of pinkeye were received--representing samples from 35 different herds throughout the state of Kansas. Using a monoclonal antibody enzyme-linked immunosorbent assay (ELISA) to a specific outer membrane protein (unpublished data), chlamydial proteins were found in 7 (14.89%) of the samples.

The positive samples were further confirmed by inoculating sample supernatants into embryonated chicken eggs and observation of Gimenez stained elementary bodies in yolk sac impression smears. It is not the authors' contention, at this time, to incriminate chlamydia as a major pinkeye etiology. However, based on the results of this survey, it appears that further work needs to be done. Both clinically positive and negative cattle should be tested to determine the significance of these findings. Also, Koch's postulates should be satisfied. Only then can we completely evaluate chlamydial involvement in bovine pinkeye.

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**References**

1. Ensminger, M.E. Beef cattle health, disease prevention, and parasite control. In: *Beef Cattle Science.* pp 723-726. The Interstate Printers and Publishers, Danville, IL; 1976. 2. Wilcox, G.E. Isolation of adenoviruses from cattle with conjunctivitis and keratoconjunctivitis. Aust. Vet. J., 1969; 45:265-270. 3. Friis, N.F. and Pederson, K.B. Isolation of mycoplasma bovoculi from cases of infectious bovine keratoconjunctivitis. Acta Vet. Scand., 1979; 20:51-59. 4. Rosenbusch, R.F. and Ostle, A.G. Mycoplasma bovoculi infection increases ocular colonization by Moraxella bovis in calves. Amer. J. Vet. Res., 1986; 47:1214-1216. 5. Wilcox, G.E. Bacterial flora of the bovine eye with special reference to Moraxella and Neisseria. Aust. Vet. J., 1970; 46:253-257. 6. Morgan, J.H. Infectious keratoconjunctivitis in cattle associated with Listeria monocytogenes. Vet. Res., 1977; 100:113-114. 7. Gibbons, W.J., Catcott, E.J. and Smithcors, J.F. The eye and its adnexa. In: *Bovine Medicine and Surgery* (1st Ed.). pp 622-626. AVMA Publishers, Wheaton, IL; 1970. 8. Moore, C.P. Diseases of the eye. In: Smith, B.P. (Ed.) *Large Animal Internal Medicine.* pp 1217. C.V. Mosby Company, St. Louis, MO; 1990. 9. Dyml, B., Behlow, R.F. and Ensminger, M.E. Isolation of the psittacosis-ornithosis-lymphogranuloma-group virus from the infectious keratoconjunctivitis of cattle. Vet. Med., 1965; 38:385-392.

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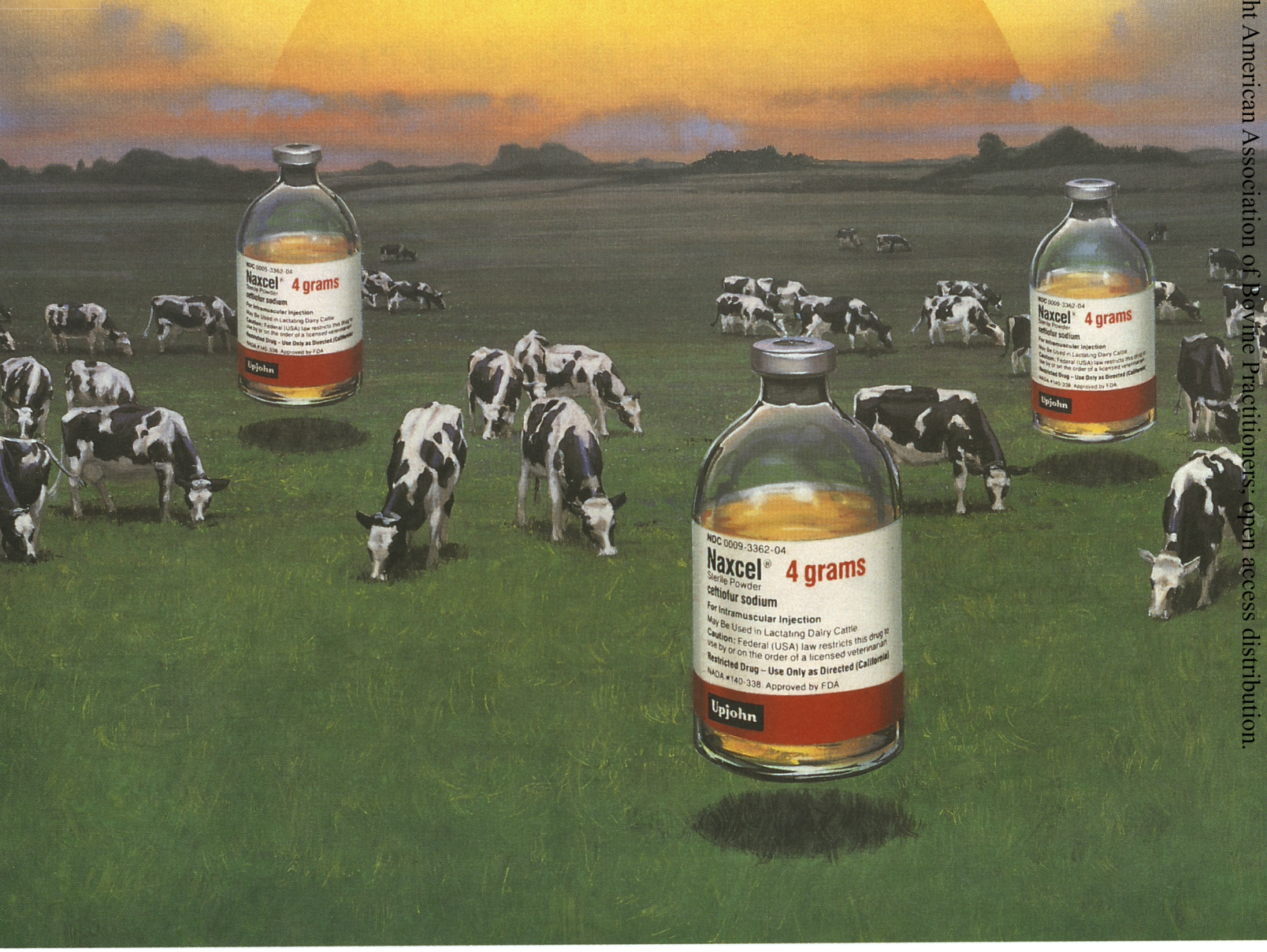


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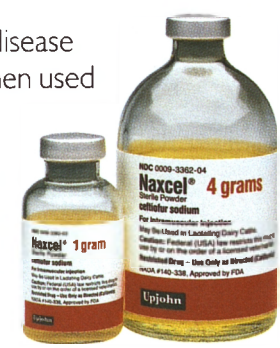


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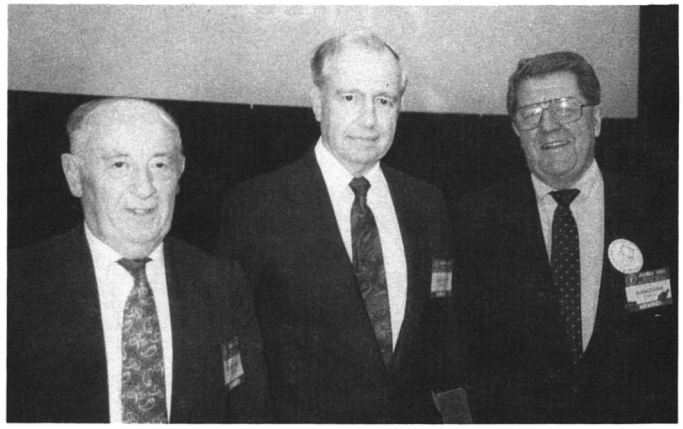

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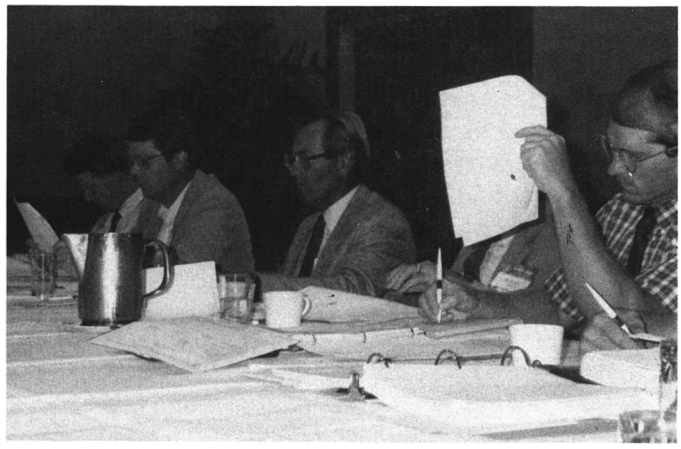

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