Br. vet. J. (1995). **151**, 587

SHORT COMMUNICATION

EFFICACY OF STRATEGIC TILMICOSIN INJECTION DURING AN OUTBREAK OF RESPIRATORY DISEASE IN HOUSED BEEF CALVES

P. R. SCOTT

Department of Veterinary Clinical Studies, Royal (Dick) School of Veterinary Studies, Easter Bush, Roslin, Midlothian EH25 9RG, Scotland

KEYWORDS: Respiratory disease; cattle; antibiotic; tilmicosin; strategic treatment.

At the peak incidence of respiratory disease in a group of 115 housed beef calves, strategic injection of 25 calves with tilmicosin did not significantly reduce the incidence of respiratory disease in the following 30 days compared with 29 untreated control cattle (32 *vs* 24%, respectively). These results challenge whether strategic tilmicosin injection of normal cattle can be recommended in the control of respiratory disease in housed beef calves.

Respiratory disease is common in young beef calves following housing, changes in weather conditions and other stressful events. The control of undifferentiated respiratory disease can be attempted by vaccinating calves against the common respiratory disease virus infections, including infectious bovine rhinotracheitis (IBR), para-influenza 3 (PI_3) and bovine respiratory syncitial virus (BRSV) (Thomson *et al.*, 1986) but such a programme is expensive and difficult to complete before housing of autumn-born calves. More often cattle which display dyspnoea, tachypnoea or frequent coughing indicating respiratory disease, are treated with antibiotics to control bacterial infection of the respiratory tract. The success of such a control programme relies upon high standards of stockmanship with early recognition of every case of respiratory disease.

In an attempt to simplify the control of secondary bacterial infection, strategic injection of all cattle with a long-acting formulation of oxytetracycline has been recommended when more than one-third of animals in the group show clinical signs of respiratory disease (Andrews, 1983). This regimen was considered beneficial during an outbreak of respiratory disease (Laven & Andrews, 1991), but no calves were left as untreated controls.

The present study investigated the efficacy of strategically-timed, single-dose tilmicosin injection on the subsequent incidence of respiratory disease in a single group of 115 housed beef calves.

0007-1935/95/050587-03/$12.00/0

The herd calved outdoors over a 10 week period from 14 September 1993 onwards with 80% of calves born within the first month of the calving period. The cows and calves were brought into cattle sheds over a 5 day period from 11–15 November 1993 when the calves were 4–8 weeks old. The calves were visually assessed twice daily by farm staff and the rectal temperature was measured for all calves which displayed depression, tachypnoea or hyperpnoea with an abdominal breathing effort. Calves with a rectal temperature >39.7°C were treated with 10 mg kg^{-1} tilmicosin (Micotil; Elanco) injected subcutaneously behind the shoulder.

The first case of respiratory disease was identified on 3 December 1993. Veterinary examination of all 115 calves were carried out on 24 December and repeated every second day for the following 2 months. On 26 December, 25 calves with no history of respiratory disease or pyrexia above 39.7°C, were injected with 10 mg kg^{-1} tilmicosin; 29 untreated calves acted as controls. Blood samples were collected from six calves during the acute phase of respiratory disease and again 3 weeks later and assayed for BRSV and PI_3 antibody titres using standard methodologies.

A total of 23 calves was treated with respiratory disease by farm staff between 3–24 December. On 24 December, 33 calves, including seven cattle treated previously, had a rectal temperature >39.7°C and were treated with a single subcutaneous injection of 10 mg kg^{-1} tilmicosin (Micotil; Elanco). Seventeen cases of respiratory disease, including seven relapsed cases, were treated with tilmicosin on 26 December. During the 30 day period following strategic antibiotic injection on 26 December, eight of 25 (32%) tilmicosin-treated and seven of the 29 (24%) control calves were treated for respiratory disease. Overall, 78 of 115 (67.8%) calves were treated for respiratory disease. Twenty-eight calves (24.3%) recorded a rectal temperature >39.7°C for a second time 4 or more days after the first injection and were retreated with tilmicosin. The median interval between tilmicosin treatments was 16 days (range 4–51).

In six calves the median BRSV and PI_3 antibody titres for acute sera [514, range 103–1452; 748, range 87 to >3000 enzyme-linked immunosorbent assay (ELISA) units] and convalescent sera (476, range 145–628; 350, range 96–2184 ELISA units) were not significantly different ($P>0.05$).

The problems associated with the strategic timing of a single injection of long-acting antibiotic, such as tilmicosin or oxytetracycline, to limit the incidence of respiratory disease in young cattle are highlighted in this study. While 23 cases of respiratory disease were identified during the 3 week period immediately following housing, no more than six calves were treated on a single day. Such a low disease incidence did not justify antibiotic treatment of the whole group of 115 calves. During the previous winter, respiratory disease was first identified in this herd 3 weeks following housing with a peak incidence 10 days after the first recognized case (Scott, 1994) compared to 21 days in the present study. The most appropriate timing for strategic antibiotic treatment prior to the peak incidence of bovine respiratory disease following housing requires further investigation. In a group of calves where strategic long-acting antibiotic injection appeared to reduce the further occurrence of respiratory disease (Laven & Andrews, 1991), there would be considerable cost savings to the farmer with respect to veterinary visits

and involvement of farm staff. While antibiotic injection of all calves would prove expensive initially, in certain herd situations this regimen could be more cost-effective than detailed monitoring of calves every second day for 2–3 weeks by the veterinary surgeon.

A previous study reported the efficacy of prophylactic oxytetracycline treatment during an outbreak of respiratory disease in young cattle (Laven & Andrews, 1991) but no calves were left as untreated controls. Furthermore the results from this and a previous study (Scott, 1994) suggest that many calves in the group do not develop a rectal temperature >39.7°C nor require antibiotic treatment for respiratory disease on clinical criteria.

Prophylactic tilmicosin medication on arrival, significantly reduced the treatment rate for bovine respiratory disease in feedlot calves (Schumann *et al.*, 1990). However the epidemiology of respiratory disease in North American feedlots is predictable with the peak incidence of morbidity and mortality in the first few weeks after arrival (Breeze *et al.*, 1982; Morck *et al.*, 1993) and as such differs from the more protracted appearance of respiratory disease in young housed beef calves where BRSV is an important respiratory tract pathogen (Scott, 1994).

The results of this study are in good agreement with the findings of Laven and Andrews (1991) who recommended that the rectal temperature of all calves in the group should be recorded every 2 days and that calves with a rectal temperature >39.7°C receive antibiotic treatment. Further field studies are required before the proposal that all calves in the group should be treated with antibiotic if more than one-third show clinical signs of respiratory disease (Andrews, 1983) can be supported.

REFERENCES

ANDREWS, A. H. (1983). *Calf Management and Disease Notes*, p. 83 Harpenden: A. H. Andrews.

BREEZE, R. G., MCMANUS, R. F., MAGONIGLE, R. A., OLSON, M. E., TONKINSON, L. V. & COSTERTON, J. W. (1982). Control of shipping fever in feedlot cattle with a long-acting oxytetracycline injectable. *Bovine Practitioner* **3,** 32–8.

LAVEN, R. & ANDREWS, A. H. (1991). Long-acting antibiotic formulations in the treatment of calf pneumonia: a comparative study of tilmicosin and oxytetracycline. *Veterinary Record* **129,** 109–11.

MORCK, D. W., MERRILL, J. K., THORLAKSON, B. E., OLSON, M. E., TONKINSON, L. V. & COSTERTON, J. W. (1993). Prophylactic efficacy of tilmicosin for bovine respiratory tract disease. *Journal of the American Veterinary Medical Association* **202,** 273–7.

SCHUMANN, F. J., JANZEN, E. D. & MCKINNON, J. J. (1990). Prophylactic tilmicosin medication of feedlot calves at arrival. *Canadian Veterinary Journal* **31,** 285–8.

SCOTT, P. R. (1994). A field study of undifferentiated respiratory disease in housed beef calves. *Veterinary Record* **134,** 325–7.

THOMSON, J. R., NETTLETON, P. F., GREIG, A. & BARR, J. (1986). A bovine respiratory virus vaccination trial. *Veterinary Record* **119,** 450–3.

(Accepted for publication 13 September 1994)