Short Communications

Hydrotaea irritans and summer mastitis in calves

J. E. HILLERTON, *Department of Zoology, University of Reading*, A. J. BRAMLEY, *National Institute for Research in Dairying, Shinfield, Reading*, D. M. BROOM, *Department of Zoology, University of Reading, Whiteknights, Reading*

Veterinary Record (1983) **113**, 88-89

SUMMER mastitis is a complex disease caused by infection of the udder with up to four species of bacteria. *Corynebacterium pyogenes* and *Peptococcus indolicus* are commonly present. *Streptococcus dysgalactiae* and an unnamed microaerophilic coccus are also implicated (Stuart and others 1951). The disease frequently occurs in calves (Bramley and others 1977). The isolation of *C pyogenes* from the headfly *Hydrotaea irritans* associated with a case of summer mastitis is reported here.

Nine, six- to seven-month-old, Friesian heifer calves were observed in September 1982 at pasture on a north-facing hillside on the edge of Salisbury Plain, near Warminster, Wiltshire. They had been kept there for four months but no closer than 50 m to other stock.

One of the calves showed signs of summer mastitis. It was standing, without grazing, some 80 m from the other calves grazing in a group. Both foreteats and glands were markedly swollen and inflamed. Samples of secretions were obtained by the farm cowhand. They were examined at the veterinary investigation centre, Langford, for bacteria by plating on blood agar plates which were incubated, both aerobically and anaerobically, at 37°C. The purulent secretions from the two forequarters contained large numbers of *C pyogenes*. In one sample small numbers of coagulase negative micrococci were detected. Anaerobic culture did not reveal *P indolicus* or *Strep dysgalactiae*. No secretions could be obtained from the hindquarters.

The number and species of flies settled on the calves were counted once for each animal at 17.00. Flies were counted on the back, head, belly, legs and udder from one side of the animal only. Three species of flies were observed on the calves (Table 1). This is typical of observations made as late as this on a cloudy day; *Musca autumnalis* have left the animals and midges have not yet appeared. *Stomoxys calcitrans* were found only on the legs. *Lyperosia irritans* were mostly on the back and along the mid-line of the belly. *H irritans*, all females, were on the undersides of the animals. A few were flying around but most were mixed with *L irritans* along the midline of the belly. Only *H irritans* were found regularly on the teats and udder.

There were considerably more *L irritans* and *H irritans* on the infected animal than on each of the uninfected group. Of the 14 *H irritans* on the half udder 12 were on the right foreteat. A swarm of approximately 50 *H irritans* was observed within 0·5 m of the infected animal while the eight healthy calves attracted a general swarm totalling about 20 flies.

A sample of the flies was then caught with a handnet from the underside, first from the infected animal and then from the other calves. A sweep of the net caught a portion of the flies which had been settled on the underside of the animal or were disturbed to within 0·5 m of the animal. Twenty-one female *H irritans* were collected from the infected calf and a total of 20 females from the other calves. All flies were kept separate, refrigerated at 4°C, in glass bottles overnight. These flies were examined for contamination by the pathogens implicated in summer mastitis.

Flies were pooled into groups of five or six from the control animals or the infected calf. All four cultures prepared from the *H irritans* caught from the infected calf contained *C pyogenes*, identified as pinpoint beta haemolytic, catalase negative colonies on ABA plates and by standard microbiological techniques (Cowan and Steel 1974) in numbers varying from 500 to 5000/ml of culture suspension. No isolation of *P indolicus* or *Strep dysgalactiae* was obtained although both had previously been isolated from *H irritans* on this and other farms. The *H irritans* collected from the unaffected calves contained none of the pathogenic bacteria associated with summer mastitis.

Flies, particularly *H irritans*, have long been suspected as vectors of summer mastitis. Tarry and others (1978) showed, under experimental conditions, that following damage to the teats, *H irritans* could transmit the disease. Sorensen (1974) reported that *H irritans* could become contaminated with *C pyogenes* but he was not explicit in the sources of his flies or their relationship to cattle. Our observations confirm that *H irritans* can become heavily contaminated with *C pyogenes* from infected animals in the field. However, further work is necessary before it can be concluded that, under field conditions, the flies do transmit the disease from one animal to another.

Acknowledgements.— We are grateful to the British Cattle Veterinary Association who partly funded this work. It is also a pleasure to acknowledge the assistance and cooperation of Mr C. Watson, veterinary investigation centre, Langford, various farmers, veterinary surgeons and Miss E. Hogben for her technical help.

References

BRAMLEY, A. J., LEAVER, J. D., KINGWILL, R. G. & SIMPKIN, D. L. (1977) *Veterinary Record* **100**, 464
COWAN, S. T. & STEEL, K. J. (1974) Manual for the Identification of Medical Bacteria. Cambridge University Press
SORENSEN, G. H. (1974) *Nordisk Veterinaermedizin* **26**, 122
STUART, P., BUNTAIN, D. & LANDRIDGE, R. (1951) *Veterinary Record* **63**, 451
TARRY, D. W., WILSON, C. D. & STUART, P. (1978) *Veterinary Record* **102**, 91

TABLE 1: Number and species of *Muscidae* distributed on the calves at 17.00 on September 9, 1982

	Species of fly	Number of flies on calves (half animal)				
		Back	Head	Legs	Belly	Udder
Infected calf	*Stomoxys calcitrans*	–	–	5	–	–
	Lyperosia irritans	80	–	4	4	–
	Hydrotaea irritans♀	–	–	–	24	14
Healthy calves	*Stomoxys calcitrans*	–	–	3·1 ± 0·7	–	–
	Lyperosia irritans	27·5 ± 5·9	–	0·4 ± 0·3	2·4 ± 1·0	–
	Hydrotaea irritans♀	–	–	–	3·8 ± 0·7	0·5 ± 0·3

Values for healthy animals are mean (± se) (n=8) per half animal
There was only one infected calf