westpoint veterinary group

A field trial using penethamate in down-calving heifers

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Introduction and Objective

Dairy heifers have been shown to often have high levels of Gram-positive bacteria *(1)* in their udder at calving. These bacteria often then cause clinical mastitis to impact culling decisions *(2)* on the first lactation animals. Reducing mastitis rate at 7 days can reduce culling due to udder health *(3)*.

Previous studies have shown the use of penethamate hydriodide (Mamyzin®, Boehringer Ingelheim) in down calving heifers can reduce mastitis *(2, 3)* in the first lactation. The question remains however, to review this approach in a commercial situation in the UK to review cost benefit for the farmer.

Penethamate hydriodide is a prodrug: releasing penicillin-G on hydrolysis, easily crosses the blood/milk barrier and concentrating in the udder. The spectrum of activity is mainly Gram-positive e.g. *Staphylococcus* spp., *Streptococcus* spp.

Materials and Methods

A field trial was devised following two groups of heifers for their udder health in the first 60 days of milk. 117 heifers were randomly allocated to one of two groups:

1. Control (n = 57) with no treatment but monitored from calving.
2. Treated (n = 60) with 15mg/kg of penethamate hydriodide (30ml of 10gm/head) by i/m injection at 8-9 days before expected calving date.

All heifers were pregnant by AI with expected calving date calculated as 280 days after service. Calving dates were from 28/08 to 02/11.

Heifers were examined at 7, 21 and 33 days post calving: checked by CMT (California Mastitis Test) and sampled for any subsequent testing. Any quarter with CMT response (#3 on 0-3 scale) had bacteriology undertaken on the corresponding sample. Somatic cell count was also recorded from every quarter using the DeLaval Cell Counter (DCC).

Records of all treatments were kept, including metritis, mastitis and lameness. All medicines used (volume and duration) plus days of lost milk with any follow up/repeat therapies recorded. Any mastitis case had a sterile sample taken for bacteriology.

Results and Discussion

There were 13 cases of clinical mastitis in the first 30 days, 6 were within the first 7 days. The control group had higher: average CMT score; cell count at animal/quarter level; rate of mastitis in the first 7 and 30 days.

Summary results *Table 1*	Control	Treated	Notes
Number	57	60	
Removed	1	1	metritis
n = 115 (459 quarters)	56 (224)	59 (235)	1 blind
Target days before calving	n/a	7	
Days calved early (mean)	4.05	0.5	all 2.25
Standard Deviation	6.21	4.04	
CMT score at 7 days			score 0-3
0	76	110	quarters
1	112	101	quarters
2	18	17	quarters
3	18	7	quarters
Average CMT	0.84	0.65	
Animals CMT #3	15	6	
Clinical mastitis first 7 days	5	1	

Table 2 Somatic cell counts	Control	Treated
Average 7 days	334.95	228.66
Average 21 days	184.03	131.37
Average 33 days	99.89	61.43
Average 60 days	107.95	68.73
Average 90 days	83.13	80.33

Table 3 Mastitus cases	Control	Treated
Lactation total cases	20	7
Affected animals First (repeated)	13 (6)	3 (2)
≤7 days in milk	5 (3)	1 (0)
≤30 days in milk	6 (3)	1 (1)
>30 days in milk	2 (0)	1 (1)

Discussion

Cost benefit to the farmer: 218 days of dumped milk was linked to mastitis cases from the first 30 days. Comparing the two groups shows mastitis in the first 7, and 8-30, days was responsible for total of 80 (+99) dump days against 10 (+29) between the control and treated group of animals. Taking the lost days and milk production (at 30p/litre) cost vs return for this strategy would have seen £3 back for every £1 spent by the farmer in this instance.

Is this responsible use of medicine? As an approach to mastitis management in heifers precalving: comparing the trial groups there is reduced total antibiotic usage in lactation for mastitis treatment (120.23gm vs 380.15gm). However, as 590gms of penethamate had initially been used is RUM really a viable argument for the strategy? The decision would need to be made at the farm level with the vet.

Conclusion

Whilst most farmers wish their vet to produce protocols that will see cost benefit through improved health - farm vets must be aware of the responsible use of medicines. In this field trial reducing early mastitis matched previous study results *(2, 3, 4)* whilst the vet should consider additional benefits toward welfare and lifetime yield needs plus return on investment.

Acknowledgements & References

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