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A STUDY OF SOME CHARACTERISTICS OF
ANTI-BLOAT PASTES RELATING TO THEIR
BLOAT CONTROL EFFICACY

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ABSTRACT

Factors relating to the bloat-controlling efficacy of several anti-bloat pastes were studied.

Firstly, the detergent diffusion rates of various pastes were measured in a rumen model. In comparison with the liquid detergent control, some formulations were found to markedly slow the washout of detergent from the model.

A theoretical paste dosing schedule versus liquid dosing schedule, based on the rumen model calculations, revealed several advantages of the paste formulation over the liquid. For example, the paste maintained a more steady detergent concentration and extended the interval between dosings.

An investigation of the effects of administration to the live animal on the intactness of the paste bolus when delivered at the cardia was undertaken. It was found that the reaction of the animal to the dosing procedure had a strong influence on the degree of intactness of the paste bolus entering the rumen. A difference between animals in this respect was observed.

It was shown that fragmented boli collected at the cardia dissolved more quickly than intact boli when subjected to mild agitation. The consequences of this in relation to persistence of protection for bloat were discussed.

The decay curves of Poloxalene detergent administered to steers in either a liquid or a paste formulation were calculated and compared. As a standard control against which other materials might be compared, the concentration decay curve of a water soluble rumen marker (polyethylene glycol, 4000) was determined in each steer.

It was found that the paste formulation did not slow the washout of detergent from the rumen by more than about two hours. Also, the average concentration dilution rates of detergent and PEG 4000 were found to be similar. However, at high Poloxalene dose rates,

the endogenous water inflow to the rumen was found to increase markedly which in turn influenced the average detergent dilution rate.

The diffusion rate curves of Poloxalene paste either in the rumen model or in vivo showed striking similarities. This suggested that the rumen model might be a valuable screening system for new paste formulations.

Several field trials were undertaken to test whether the bloat-controlling efficacy of paste formulations of detergent was better than that of liquids, and to examine the validity of the rumen model findings. Unfortunately, the bloat challenge on each occasion was insufficient to collect the necessary data. However, valuable information regarding the requirements for satisfactory field trials was obtained and are discussed.

In summary, the results of the study showed that:

- 1) Pastes can be formulated which, relative to similar liquid preparations, will slow the rate of detergent washout from a rumen model.
- 2) The in vivo detergent decay curves of both Poloxalene paste and liquid were similar to those determined in vitro. Together with (1) above, this suggests the rumen model might be a useful screening system.
- 3) Paste boli delivered at the cardia can vary widely in intactness between and within animals and this depends largely on animal reaction to the dosing procedure.
- 4) Fragmented boli dissolve more quickly than intact boli in vitro and this characteristic may be crucial in detergent longevity in the rumen liquor.

Therefore it is concluded that:

- 1) The rumen model warrants development and testing.
- 2) An efficient analytical method needs to be developed for detecting detergents in rumen liquor.

This would allow accurate in vivo detergent decay curves to be established. Without this, further progress will be slow.

- 3) Field trials must still be carried out to provide and confirm relationships between in vitro results and field efficacy.

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