

# Opsonizing Antibodies to Virulence Factors of *Pasteurella haemolytica*

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Opsonization of *Pasteurella haemolytica* by whole serum has been documented. However, the role of antibodies to specific antigens has not been investigated. This study was performed to examine the phagocytosis of *P haemolytica* by antibodies to specific virulence mechanisms. Antibodies were produced in rabbits to capsular polysaccharide, LPS, leukotoxin, capsular extracts, and spheroblasts. These antibodies were used to opsonize H<sup>3</sup>-thymidine labelled *P haemolytica* for bovine peripheral blood polymorphonuclear cells (PMNs). Results showed that antibodies to each antigen preparation except capsular polysaccharide opsonized bacteria cultured to the stationary phase of growth better than bacteria cultured to

the logarithmic phase of growth. The combination of antibodies to capsular polysaccharide, LPS, and leukotoxin opsonized bacteria cultured to the logarithmic phase of growth better than each antibody alone. These results indicate that the presence of leukotoxin neutralizing antibodies does not improve opsonization of *P haemolytica* by antibodies to other virulence factors although phagocytosis was achieved by antibodies to virulence factors (LPS, capsular polysaccharide, and leukotoxin) as well as by antibodies to surface antigens. These results suggest the need for future studies to evaluate the role of these antibodies on the functional capacities of the PMNs once bacteria have been phagocytosed.

## Effect of Alkaloids Produced by *Acremonium coenophialum* in Fescue on Vascular Function in Cattle

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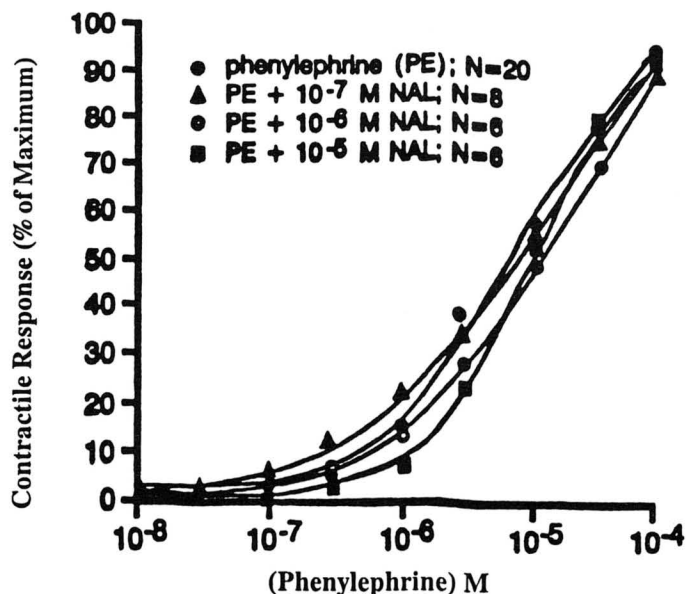
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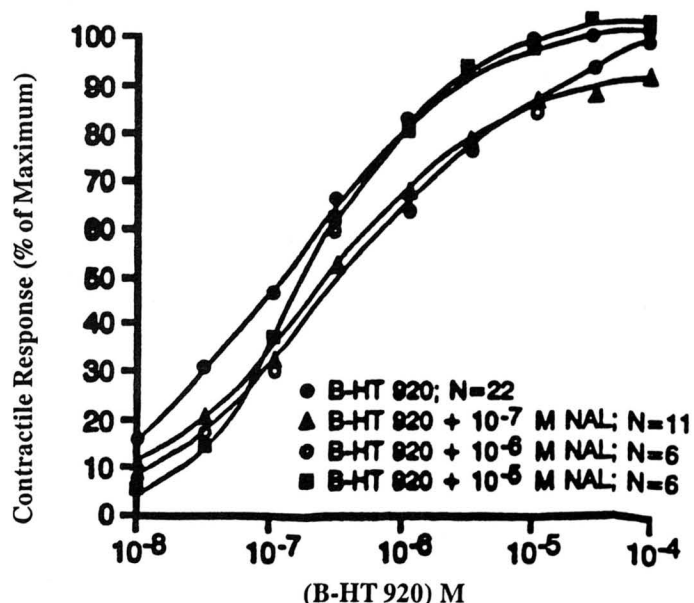
The purpose of our studies have been to evaluate the vasoconstrictive potential in cattle of alkaloids found in toxic fescue, using an isolated vessel model (lateral saphenous vein and dorsal metatarsal artery). The method used in our studies previously has been described (Solomons, Oliver, and Linnabary, Am. J. Vet. Res., 50:235-238, 1989). Vasoconstriction is a well documented clinical sign of cattle that ingest *Acremonium coenophialum*-infested fescue grass or hay. Vessels are constricted by alkaloids present in toxic fescue, such as N-acetyl loline, ergovaline, ergonovine and ergotamine. Using selective agonist

and antagonist drugs for adrenergic and serotonergic receptors, in the presence and absence of alkaloids found in fescue, the biogenic amine receptors affected by the alkaloids can be determined. This information can then be used to develop appropriate alleviator drugs to diminish the toxic effects of the alkaloids present in fescue forage. The effects of N-acetyl loline and ergotamine on adrenergic and serotonergic receptors will be described, as will the influence of potential alleviator drugs such as thiabendazole and phenothiazine. Examples of data to be presented are shown below.

Effect of N-acetyl loline (NAL) on phenylephrine-induced contraction of the lateral saphenous vein (cranial branch) of cattle



Effect of N-acetyl loline (NAL) on B-HT 920-induced contraction of the lateral saphenous vein (cranial branch) of cattle



## Projected Days Open – Fact or Fallacy

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The study is designed to compare four reproductive indexes which attempt to evaluate "current" reproductive performance of the active breeding group by comparison to Actual Days Open. The four indexes are: (1) *JMR/Projected Days Open* (2) *Michigan DHIA Average Days Open* (3) *Projected Minimum Days Open* (4) *Heat Detection/Conception Rate Average Days Open*. Simple linear regression was used on a small data base to measure accuracy of the predictions versus Actual Days Open. A Lotus 123r3 spread sheet was designed to compile preliminary data from reproductive information in eleven Holstein dairy herds. Each herd was monitored for 16 months with herd size ranging from 33 to 187 cows (Median = 61). Total cow numbers is estimated at 700. Preliminary results suggest that the predictive power of these indexes is not extremely accurate. However, their accuracy improves when farm is added as a variable in the multiple regression model. Culling due to reproductive inefficiency artificially depresses Actual Days Open and is a critical factor which may effect the accuracy of these four indexes. In conclusion, it appears that these four indexes which are used as "leading indicators" of current reproductive performance, must be adjusted by some factor which can account for reproductive culling in dairy herds. Practical and

economical implications will be discussed.

### Introduction

To maintain economic viability, dairy producers must be capable of meeting the broad array of challenges presented by the dynamic technical, political, and economic environments in which they exist. In that regard, economically efficient animal health management while assuring animal welfare has become a top priority; effective diagnostic, therapeutic, and preventive methods for application at the population level have become critically important. Specifically, the reproductive health and performance on a dairy farm are essential to the economic survival of that business (Louca and Legate, 1968 and Holmann *et al.*, 1984). A high reproductive rate maximizes yearly milk flows, provides more replacements and allows for greater selection for milk production (Britt, 1985 and Weller *et al.*, 1985). To achieve efficient reproduction, a current and reliable measure of reproductive disease status is necessary as a monitoring tool to assist management decision-making. Evaluation using up-to-date and dependable information for disease monitoring is imperative. It is the animals in the active breeding group that are economi-