BACTERIUM HOST CELL INTERACTIONS: EFFECT OF *HAEMOPHILUS SOMNUS* ON PHAGOCYTOSIS, NITRIC OXIDE PRODUCTION AND CHEMILUMINESCENCE RESPONSE OF BOVINE MONONUCLEAR PHAGOCYTES

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The interaction between bovine mononuclear phagocytes (BMP) and *Haemophilus somnus* are known to be complex. Using a flow cytometric phagocytosis assay, it was found that logarithmically growing *H. somnus* significantly inhibited the phagocytosis of opsonized *S. aureus* by bovine alveolar macrophages (BAM) obtained both from healthy calves and from cattle experimentally infected with *H. somnus*. However, neither heat- nor formalin-killed, logarithmically growing *neither H. somnus nor in vitro* passed *H. somnus* showed any effect on the phagocytic activity of these cells. In contrast to BAM, bovine blood monocytes (BBM), had a significant increase in their phagocytic activity following \textit{in vitro} exposure to logarithmically growing *H. somnus*. The bactericidal ability of bovine mononuclear phagocytes in interaction with *H. somnus* was studied using two \textit{in vitro} assay systems measuring nitric oxide (NO) production and chemiluminescence response. *H. somnus* rapidly inhibited the Luminol-dependent chemiluminescence (LDCL) of BBM, and of BAM costimulated with opsonized *Staphylococcus aureus*. Inhibition of the LDCL response of BBM and BAM was abrogated with either opsonized or killed *H. somnus*. In contrast to inhibition LDCL of BMP, both BBM and BAM infected with *H. somnus* had stimulated production of NO. Using a calorimetric bactericidal assay, it was found that: (1) *H. somnus* was able to survive within BBM \textit{in vitro} and the kinetics of its survival were similar to that seen in BBM isolated from experimentally infected cattle; (2) treatment of BBM with varying concentrations of \textit{BoIFN-γ BoTNF-α, BoIL-β, BoGM-CSF} and \textit{E. coli} LPS had no effect on the survival of *H. somnus*. Moreover, using ultrastructural studies, and \textit{3H-uracil} incorporation into nucleic acids, it was possible to demonstrate the survival of *H. somnus* in BMP. These results indicate that the ability of *H. somnus* to modulate microbicidal activity of BMP would, in turn, assist the intracellular survival and immunopathogenesis of bovine haemophilosis.