PHAGOCYTOSIS OF STAPHYLOCOCCUS AUREUS AND ESCHERICHIA COLI BY BOVINE POLYMORPHONUCLEAR LEUKOCYTES

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The polymorphonuclear leukocytes (PMNL) play a key role in defense against bacterial infections. Phagocytosis is one of their most important functions and essential for the elimination of invading microorganisms. The aim of the present work was to compare the phagocytosis rates of propidium iodide-labeled Staphylococcus aureus (SaPI) and Escherichia coli (ECPI) of bovine granulocytes. Thus, 100 µL of whole blood from 15 dairy cows in lactation were incubated with 100 µL of Staphylococcus aureus (ATCC 25923) or Escherichia coli (O98:H28), at the concentration of 2.4 x 10⁹ colony forming units per milliliter, and 900 µL of phosphate-buffer saline (PBS) for 30 minutes at 37 °C. The samples were analyzed by flow cytometry where at least 20,000 polymorphonuclear leukocytes based on their cell size and granularity characteristics were acquired. The Flow Jo Tree Star software was used to analyze the data. The mean PMNL phagocytosis rates of SaPI and ECPI were 55.04 ±11.92 and 28.95 ±11.90 (P > 0.0001), correspondingly. The numbers of bacteria phagocytosed by each PMNL given by an arbitrary value recognized as phagocytosis intensity were 53.84 ±18.30 and 20.33 ±10.00 (P > 0.0001) for SaPI and ECPI, respectively. The results of the present study pointed out to lower phagocytosis function of PMNL for ECPI than for SaPI. Thus, the blood PMNL phagocytosis function can vary according to the bacteria and maybe strain challenge in dairy cows. This effect can be due to the different strategies of bacteria to subvert detection by phagocytes.