

Title: **Inhibition of *Salmonella* Typhimurium by immunoglobulin Y of rhea (*Rhea americana*)**

Authors: Corrêa, E.S.¹, Pinto, L.W.S.¹, Campoy, S.², Logullo, C.J.¹, Vieira-da-Motta, O.¹

Institutions: ¹ UENF – Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, RJ, Brasil, ² UAB – Universitat Autònoma de Barcelona, Cerdanyola, Barcelona, Espanha.

Abstract: Food-borne diseases, a part of being an important economic burden, are a global public health problem. Non-typhoidal *Salmonella*, such as *S. Typhimurium*, are among the most common zoonotic pathogens involved in such illnesses. *Salmonella* is commonly found in the intestines of healthy birds and mammals. The IgY antibodies are the major serum immunoglobulin in birds, reptiles and amphibians, and are transferred from serum to egg yolk to confer passive immunity to their embryos and descendants. IgY exerts an antimicrobial activity against pathogens by binding, immobilizing and consequently reducing or inhibiting the growth, replication or colony forming ability of pathogenic bacteria. The IgY antibodies appear as a promising alternative to conventional preventive and therapeutic methods to control infections caused by different pathogens as bacteria, fungi and protozoa. In this study, IgY purification from non-embryonic egg yolk of rheas (*Rhea americana*) has been carried out by ammonium sulfate precipitation and affinity chromatography. . Animals were previously immunized (200 mg/animal) with recombinant FliB – phase 2 flagellin of *Salmonella* Enteritidis PT4, obtained in *E. coli* BL21; subsequently, the inhibitory effect of IgY has been tested against *S. Typhimurium* (ATCC14028). A solution containing 3 mg/ml of specific IgY has been able to inhibit the multiplication of *S. Typhimurium* in liquid medium BHI plus NaCl 0,3M, compared with the non-treated or the treated with unspecific IgY groups. With this significant (21,6 %) antibacterial effect *in vitro* and the high yield of anti-FliB IgY of *Salmonella* produced in rhea eggs, encourages the production and use of that immunoglobulin as an antimicrobial alternative against salmonellosis and to replace chemical preservatives to prevent multiplication of this bacteria in the food industry.

Keywords: Rhea IgY antibodies, growth inhibition, FliB, *Salmonella* Typhimurium, *Rhea americana*