



Positive effect of *Euglena gracilis* derived paramylon on immunoglobulin Y content of egg yolk

Valentine Van Hamme, Ricardo Neto, Susanne Kirwan, Geoff Horst

Paramylon is a linear, unbranched beta-1,3-glucan polymer that is isolated from the single-cell microalga *Euglena gracilis*. Research has shown paramylon has immunomodulatory effects in animals, through binding on the dectin-1 receptor of antigen presenting cells. Recent studies in mammals have shown that paramylon increases antibody titers of colostrum, resulting in positive effect on health and survivability of the offspring. However, no studies are available in birds investigating the effect of paramylon on the immunoglobulin content of eggs. The objective of this proof-of-concept study was to assess the effect of paramylon on the immunoglobulin content of eggs when supplied to the bird, in which laying hens were used as a model for breeding hens.

A total of 500 Lohmann brown laying hens of 18 weeks of age, housed in enriched cages for 32 weeks were included in the study. The trial consisted of two treatments (10 replicates each): a control (C) group and a paramylon (P) group treated with 21.8 grams of product per liter of water at specific time points (5 days at arrival and every 35 days for 5 days). Following parameters were measured: laying index, FCR, daily egg mass and % of broken eggs. Immunoglobulin Y (IgY) content of egg yolk was measured monthly in 20 eggs per treatment by ELISA.

Results of the trial show numerical differences: increased laying index for P compared to C (86.1 vs 84.5% respectively), higher daily egg mass (56.1 vs 55.0 g per egg/bird respectively) and there were reductions in broken eggs (2.3 vs 2.8% respectively). No difference in FCR was noted. IgY content of egg yolk coming from P birds was increased compared to eggs of C birds at each time point, with an average of 5.3 mg/ml compared to 3.8 mg/ml ($p < 0.001$).

This proof-of-concept study shows the potential of paramylon to increase immunoglobulin content in eggs. Further research should be performed in breeding hens to evaluate a potential impact on health and survivability of day-old chicks. Furthermore, this study shows paramylon is safe to use with no negative impact on performance, a concern raised by producers when using immunomodulatory products.