

Nanochemistry and Nanobiotechnology

Composition for protection of hatchable eggs against pathogenic microbial flora

R.V. Denysov¹, T.O. Chernyavska¹, O.G. Bordunova¹, V.D. Chivanov²

¹ *Sumy National Agrarian University, 160 Kirov str, Sumy city, 40021, Ukraine.*

² *The Institute of Applied Physics of the National Academy of Sciences of Ukraine, 58 Petropavlivska str, Sumy city, 40000, Ukraine.*

In incubation technology a great importance has a pre-setting eggs processing with disinfectant in order to prevent secondary microbial contamination. Taking the urgency of this issue into consideration, the unique composition was elaborated, offering anti-viral and fungicide protection of hatchable eggs against pathogenic microbial flora [1]. The composition content includes: natural biopolymer chitosan, hydrogen peroxide (H₂O₂), titanium dioxide (TiO₂) in nano- and ultrafine anatase grade with crystal structure, yellow iron oxide pigment (Fe₂O₃), cuprum sulphate (CuSO₄) and other components.

The aim of the investigation was the elaboration of hatchable eggs protection technology directed against causative agents of infectious diseases and the increase of resistibility level using disinfecting composition based on chitosan and metal oxides on growing birds. The microstructure of hen eggshell was scrutinised before and after processing with the composition. During the whole incubation process the level of microbial contamination on processed eggs was examined.

Thus, the use of “artificial cuticle” ARTICLE technology with the composition in order to create a protective antimicrobial cover on hatchable eggs conduces the increase of hatching rate on 6.3-20.3% and a considerable decrease of pathogenic microbial flora on the surface of hatchable eggs to 1.83-1.92% from the source quantity of bacterial colonies. The suggested technology of “artificial cuticle” ARTICLE ensures the ecological-friendly industrial safety (all composition components are non- or low-toxic).

1. O.Bordunova. Nanocomposyt of chitosan and titanium dioxide in biomimetic protection technology of hatchable eggs of domestic fowl / O.Bordunova // Aviculture. Interagency thematical academic collection. Issue 65. – Birky, 2010. – P. 116-127.