DISTRIBUTION AND CHARACTERIZATION OF THE GOBLET CELLS IN THE OSTRICH SMALL INTESTINE DURING THE PRE-AND POSTHATCH PERIOD

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Abstract. The distribution of the goblet cells has been widely studied both in mammals and in birds, mainly hens; however, the functional studies of cells, especially in growing birds of different species are still topical. The aim of this research was to determine the density of the goblet cells in the mucosa of the ostrich small intestine pre hatch and during the first months of life as well as to differentiate the goblet cells by the chemical composition of mucopolysaccharides. In the research, 42 ostriches of both sexes raised in Latvia were used, including six embryos obtained on the 38th incubation day and 36 chicks of age 1, 3, 7, 14, 30 and 60 days post hatch, distributed in groups of 6 birds in each group. The length of each small intestine segment was measured (mm). Histological samples of tissue (0.5-1x1cm) were taken from the small intestine: the medium segments of the duodenum, jejunum and ileum.

For overall histological assessment, the tissue samples were deparaffinized, hydrated and stained with haematoxylin and eosin stain complying the standard methods. By applying the histochemical reactions, the the goblet cells were differentiated by the qualitative composition of mucopolysaccharides into cells containing acid (AB+), neutral (PAS+) and mixed (AB/PAS+) mucopolysaccharides. The density of the goblet cells was determined in 10 villi of each preparation, each segment of the small intestine for each individual. The density of the obtained cells was calculated per 1mm^2 of the median longitudinal section of a villus.

The data obtained in the study were statistically processed by SPSS 17.5 software programme.

The density (number) of the goblet cells of the ostrich small intestine per one area unit of mucosa from the 38th day of embryonic development until the age of 30 days tended to decrease in all segments of the small intestine. On day of hatch, the largest density of the goblet cells per 1 mm^2 of mucosa was observed in the duodenum, in turn at 60 days of age - in the ileum. Differences of the density of goblet cells and the proportional division were observed depending on the chemical composition of mucopolysaccharides in different segments of the small intestine of ostrich chicks. The obtained results characterize both the quantitative and qualitative differences of mucopolysaccharides (mucus) secretion that is possibly connected with various specific roles of the small intestine segments in the processes of nutrients absorption.

Keywords: ostrich chicks, small intestine, goblet cells, mucopolysaccharides.