EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS)
ISSN 2660-9630
www.ejlss.indexedresearch.org Volume 14, 2022 ||

Effect of Probiotics on Liver Morphogenesis of Chicks in Postnatal Ontogenesis of Broiler Chicks of Ross Cross-308

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Abstract: *It was found that the absolute parameters of the length and weight of the liver of broiler chickens of the ROSS-308 cross significantly increase during the period from the first day of postnatal ontogenesis to the age of 14 days, and at the subsequent studied stages this process proceeds without significant deviations. Liver morphometric parameters were especially high in broiler chicks of the 3rd and 4th groups, who were additionally given probiotics at the late stages of postnatal ontogenesis, starting from day 14.*

Keywords: *poultry, chickens, broiler, ROSS-308, cross, liver, postnatal ontogenesis, length, weight, growth coefficient, linear size, absolute index, breeding, diabetes mellitus, atherosclerosis, therapeutic, preventive, dietary.*

Date of Submission: 15-01-2022 ***Date of Acceptance: 05-2-2022***

Introduction. In our country, the poultry industry is developing rapidly today. In peasant, farm and personal subsidiary farms, the feeding of the most prolific breeds and crosses of chicks is well established. Mainly in our country, the breeds of the meat direction (broilers) ROSS – 308 (Great Britain), Cobb – 500 (USA) are popular. But they are vaccinated against infectious diseases according to the epizootic plan once a week, starting from the one-day hatching of chicks and up to 110 days of age, that is, until the transition to a large group of chickens. Frequent carrying out of such veterinary measures causes a decrease in their productivity, which leads to the emergence of various stressful situations in chicks. To protect themselves from these stressful factors, it is required that their food is rich in vitamins, enriched with probiotic and prebiotic supplements.

The use of probiotics is widespread in the poultry industry today and is an effective means of promoting poultry products.

Currently, poultry industry products are supplied to the food market -broiler chicken liver. Chicken liver has long been known as a valuable food product-a product of dietary, therapeutic and preventive value. Chicken liver is especially recommended for children, pregnant women, in the recovery period after childbirth and after surgery, in the diet of people suffering from chronic fatigue, physical and mental fatigue, a tendency to atherosclerosis, obesity and diabetes [1, 6].

Intensive industrial technologies for growing broiler chickens differ sharply from the natural biocenoses of poultry, which leads to a change in the morphological and functional state of internal organs, especially the liver. This is manifested, respectively, by a change in the quality of the liver (as a food product). [2, 3, 4].

B.According to Burger (2010), it was shown that one of the most common structural changes during pathology in the liver is fatty degeneration of hepatocytes and inflammatory changes in the parenchyma. However, these changes can lead to regeneration of the liver of chicks when broilers add probiotic drugs to the feed of chicks.

The study of the morphology of the liver of poultry as the largest multifunctional gland of the digestive organs is of theoretical and practical interest for veterinary medicine, biology and poultry farming [6].

The role of the liver in the body is important and diverse. It is the main metabolic organ. The liver is the largest complex multifunctional digestive gland. As a result of impaired liver function, intoxication and lack of nutrients begin in the body. All this worsens the vital activity of the animal and often leads to death. However, this organ has regenerative abilities [5, 7].

Materials and methods. Research work was carried out on the liver of broiler chickens of the ROSS-308 cross, brought from Dargomyzh Poultry Farm Fayz LLC of the Samarkand region. They were divided into 4 groups, each of which had 40 chicks. The chicks of the whole group were fed in a diet with the same content. The chicks of the first group were given only food and water; the chicks of the second group were given food, water and vaccinations, preventive drugs, which were carried out in agricultural conditions; the third experimental group added nutrients, water and probiotic water to the chicks, in which 100 million microbial cells were stored; the fourth experimental group added probiotic water to the chicks, in which 200 million microbial cells were stored. Morphometric dimensions of the experiment 1-, 7-, 14-, 21-, 28- and was received on the 35th day.

General morphological methods were used to determine the linear dimensions and weight of the organ.

All numerical data obtained as a result of scientific research are E.K. Mathematical processing was performed according to the Merkueva method.

The mathematical and statistical analysis was performed in a Microsoft Excel spreadsheet of a computer using the Student and Fisher criteria.

Results and their analysis. As a result of scientific research, morphometric indicators of the liver of broiler chickens demonstrate a certain dynamics of change at various physiological stages of postnatal ontogenesis.

The absolute indicator of the liver length of chicks of the first group is 3.34 ± 0.11 cm on the first day of postnatal ontogenesis with an intensive increase By the 7th day (3.76 ± 0.07 cm, $R < 0.02$; $K = 1.12$) and a gradual continuation of this process until the 35th day of the follow–up study, i.e. by the 14th day–5.86 ± 0.18 cm ($K = 1.56$), by the 21st day–7.74 ± 0.12 cm ($c = 1.32$; $R < 0.04$), at 28 days-8.54 ± 0.23 cm ($R < 0.03$), and at 35 days-8.68 ± 0.29 cm ($c = 1.02$; $R < 0.04$). It was found that the coefficient of increase of this liver indicator in the period from the 1st to the 35th day of chicks is 2.60 times.

The absolute liver mass index in chicks of the first group on the first 1 day of postnatal development is 3.92 ± 0.12 g, by the 7 th day it increases to 4.63 ± 0.15 g ($c = 1.18$; $p < 0.04$), by the 14th day this process can proceed more intensively, that is, up to 14.55 ± 0.37 g ($c = 3.14$), and then cyclically continues until the next 35 days, that is, up to 21 per day – 26.95 ± 0.53 g ($c = 1.85$; $p < 0.02$), at 28 days – 37.89 ± 0.55 g ($c = 1.40$; $p < 0.02$), at 35 days–47.09 ± 0.27 g ($c = 1.24$; $p < 0.03$). It was found that the coefficient of increase in the absolute liver index in chicks during the studied stages of postnatal ontogenesis is 12.01 times.

The absolute index of liver length in chicks of group 2 from the 1st to the 7th day of postnatal development increases with some intensity, reaching from 3.24 ± 0.07 cm to 3.52 ± 0.13 cm (c =

1.09; $p < 0.04$), and at a later age cyclically, to 6.24 ± 0.09 cm (c = 1.77) at 14 days and 7.24 ± 0.20 cm (c = 1.16) to 7.66 ± 0.27 cm (c = 1.06; $R < 0.04$) at 28 days, with an increase to 8.88 ± 0.31 cm (c = 1.16) in 35 days. It was found that the coefficient of increase of this liver indicator in the period from the 1st to the 35th day of chicks is 2.74 times.

The absolute liver mass index of group 2 chicks on the first day of postnatal development is 3.95 ± 0.09 cm, by the 7th day it increases to 4.28 ± 0.1 g (c = 1.08; $p < 0.03$), significantly accelerating this process until the 14th day (14.83 ± 0.22 g; c = 3.46), and in the next 35 days it retains this condition, it is almost noted that at 22.28 ± 0.61 g (c = 1.50; $P < 0.03$), at 28 days - 33.81 ± 1.27 g (c = 1.51 ; $p < 0.04$), at 35 days–48.04 ± 1.65 g (c = 1.42; $p < 0.04$). It was found that the coefficient of increase in the absolute liver index during the studied stages of postnatal ontogenesis of chicks is 12.15 times.

The absolute index of liver length in chicks of the 3rd group from the first to the 7th day of postnatal ontogenesis can increase from 3.28 ± 0.06 cm to 4.02 ± 0.15 cm ($R < 0.04$; C = 1.22), as well as in chicks of the first and second groups, with further intensification of this process in 14 days (5.76 ± 0.16 cm; C = 1.43), and in the later stages periodically increase from 21 to 6.6 it was found that it reaches 0.17 cm (c = 1.14), in 28 days - 7.56 ± 0.19 cm, at 35 days – 8.24 ± 0.24 cm ($R < 0.03$; c = 1.09). It was found that the coefficient of increase of this liver indicator in the period from the 1st to the 35th day of the chicks' life is 2.51 times.

With an absolute indicator of the liver mass of chicks of group 3 in the first 1 day of postnatal development of 3.93 ± 0.10 g, there is some intensive increase up to 14 days, i.e. up to 4.54 ± 0.14 g (c = 1.15; $R < 0.04$) in 7 days, up to 14 days -15.96 ± 0.29 g (c = 3.51), in 21 days – 25.77 ± 0.83 g (c = 0.15; $R < 0.04$ 1.61), in 28 days – up to 45.47 ± 1.67 g (c = 1.76), in 35 days – up to 48.04 ± 1.65 g ($p < 0.04$). It was found that the coefficient of increase of this liver indicator in the period from the 1st to the 35th day of the chicks' life increases by 12.20 times.

It was observed that the length of the liver in chicks of group 4 from day 1 to day 7 increases from 3.5 ± 0.08 cm to 3.66 ± 0.06 cm (c = 1.04), and by day 14 - to 6.44 ± 0.07 cm (c = 1.76; $p < 0.02$), and postnatal ontogenesis continues this condition in stages until the next 35 days studied. That is, it was found that this indicator in 21 days – up to 6.8 ± 0.14 cm (c = 1.05), in 28 days - up to 7.84 ± 0.21 cm ($p < 0.03$; c = 1.15), in 35 days - up to 7.98 ± 0.27 cm ($p < 0.04$). It was found that its growth coefficient increases up to 2.28 times during the period from the first day to the 35th day of postnatal development.

The absolute liver mass index of chicks of group 4 in the first 1 day of postnatal development is 3.98 ± 0.1 g. before 7 days of age, this indicator can be increased to 5.66 ± 0.1 g (K = 1.43; $p < 0.03$), at 14 days of age - up to 12.46 ± 0.2 g (K = 2.20), at 21 days of age –up to 22.05 ± 0.3 g (K = 1.76), at 28 days of age –it was found that it increases to 47.26 ± 1.7 g (c = 2.1), and at 35 days –up to 50.77 ± 1.9 g ($p < 0.04$). It was noticed that the coefficient of increase of this liver indicator is 12.82 times for the period from the 1st to the 35th day of the chicks' life.

Analysis of the results of the conducted studies showed that probiotics have a significant positive effect on the growth rate of broiler chickens, while it is noted that the increase in liver weight is proportional to the increase in body weight, however, in chickens that were given probiotic, liver weight was slightly higher than in control group chickens of the appropriate age.

Conclusion: - it was noted that the absolute values of the length and weight of the liver of broiler chickens increase significantly during the period from the first day of postnatal ontogenesis to 14 days of age and that at the subsequent stages studied, this process proceeds without significant deviations;

- during the studied stages of postnatal ontogenesis of broiler chickens (from day 1 to day 35), an increase in the morphometric size of the liver in absolute weights compared to their absolute length was observed;
- it was found that the absolute values of linear size and liver mass are especially high in broiler chickens of the 3rd and 4th groups, which were additionally given probiotics at the late stages of postnatal ontogenesis, starting from the age of 14 days.

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