Use of technical means to increase the productivity of poultry meat products

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Abstract. When raising broiler chickens of the Hubbard cross at 35 days with a large-group cage method of keeping, it is possible to increase the usefulness of diets and feeding due to optimal levels of metabolic energy (MJ/100g) depending on age and body weight: 1.25 – on 0-10 day, 1.28 – on 11-20 day, 1.30 – on 21-33 day and 1.33 – on 34 day and before slaughter. When they are grown, the content of raw organic nutrients in the diet changes: fat – from 3.79 to 6.85%, fiber – from 2.87 to 4.02% and protein – from 21.74 to 18.62%, respectively. To improve metabolism, Complevit, Selmevit and BioMax were used, which were subjected to laser radiation in the area of a bird’s chest. In meat chickens of the experimental groups, in comparison with the control group, the intensity of growth and development is due to better digestibility of nutrients in the diets: dry matter (by 3.4-5.9%), organic matter (by 2.6-5.9%, P-0.001), raw fiber (by 6.4-16.3%). These studied biologically active complexes (BAC) are freely available in the regions of the country, are not expensive and should not be included in the diets of broiler chickens. They are subjected to mandatory laser radiation with an exposure of 8 sec and 15 sec in the chest area. To increase the energy of their growth, there is no need to harvest large, expensive various feed resources. Laser-irradiated components significantly reduce feed consumption at high body weight of broilers.

1. Introduction

Applied methods and technologies for the production of feed and components of plant and animal origin for poultry enterprises in the country and abroad need to improve the system for assessing the quality of high-protein and carbohydrate concentrates in the diets of broiler chickens in certain age periods of their cultivation [1, 3, 7, 8]. Available feed products and feed additives are very expensive, and do not always justify the funds [4, 6, 16, 19]. Often in specialized poultry enterprises in the regions of the country, against the background of the main diet, various biologically active complexes are used (amino acids, fat-water-soluble vitamins, mineral microelements, lipoic acid, selenium, etc.) [5, 9, 13, 14, 15, 19, 20] to improve the safety and health of meat chickens. For more than 10-15 years, ceiling and floor aeroionizers of domestic production have been used for growing them [10, 11, 13, 17]. A new impulse in the modern level of development of meat poultry farming was recorded in the use of a laser beam to improve metabolic processes, immunity, and increase the safety and productivity of broiler chickens [2, 12, 13]. Biologically active components (Complevit, Selmevit and BioMax), both individually and in combination with them (in a ratio of 1:1 by weight), exposed to laser radiation with an exposure of 8 sec and 15 sec, against the background of the main diet, cause an increase in the processes of digestion,
hematopoiesis, growth and development, and payment for food products [3, 5, 14, 15, 20]. Semiconductor laser devices operate in automatic continuous mode, in a constant magnetic field. At the same time, the effect of laser action on the tissues of the animal body is significantly improved by enhancing the processes of metabolism. The effect of the combined effect of laser radiation and a constant magnetic field on biological objects is not the usual sum of the effects of these two factors, but has the character of a synergistic-resonant action [2, 3, 5, 14, 16, 17, 20, 21].

When the combined effect of low-level laser radiation (LLLR) and a constant magnetic field on the same area of a biological object is not a simple summation of unidirectional action, but qualitatively new processes develop [6, 11, 15, 18, 19, 20, 21]. Therefore, the use of this research direction in the rearing of broiler chickens in the conditions of large-cage keeping is an urgent task, and the results obtained have both practical and theoretical significance.

The purpose of the study is to analyze the possibility of using biologically active complexes (BAC) – Complevit, Selmivit and Biomax in the cultivation of broiler chickens.

2. Materials and methods
The study was carried out based on the results of three scientific, economic and physiological experiments on broiler chickens of the Hubbard cross at site No. 3 Patio of LLC Belgrankorm-Veliky Novgorod in Krestetsky district of Novgorod Region. The experiments were carried out on clinically healthy broiler chickens from one day old following the principle of the pairs of analogs, taking into account the origin and body weight, 140 heads each in control and experimental groups.

The recipes for full-breeding compound fodders were changed four times over the entire period of growing: first – PK-5-1-331 (middlings), pre-launch, age – 0-10 days; second –PK-5-2-332 (granules), starting, age – 11-20 days; third – PK-5-3, for growth, age – 21-33 days (granules); fourth – for finishing fattening (granules), age – from 34 days to yield (PK-6). The body weight of broiler chickens is determined by the method of individual weighing on electronic scales 4 times in the following terms (day): 1; 4; 15; 35 (using CFS AP-06EX scales).

All chicken stock of control and experienced groups in scientific, economic and physiological experiments were marked with indelible black paint in the head and back area. When organizing and conducting experiments and accounting for feed, water, excretory wastes, survival rate (livestock) and control, the special partitions (plastic) with holes were installed to comply with the optimal microclimate.

For physiological experiments, four days before slaughter, three heads of broiler chickens were selected (against the background of scientific and economic experiments). The clinical and physiological state of broiler chickens was determined by daily inspection of the livestock, the amount of feed and water consumed – by taking into account the amount of the given feed and the residue at the end of each day of cultivation, with the calculation of actual eatability.

The slaughter of poultry was carried out at the age of 35 days in a specialized slaughter workshop of a poultry plant. The biochemical composition of blood serum was determined in the chemical laboratory of the Novgorod Regional Oncological Clinical Dispensary according to conventional methods.

The studies used domestic semiconductor lasers Pattern 2K-Super (Kaluga, Autonomous Non-Profit Organization of Additional Vocational Education) (LAN International Academic Attestation Center), according to the methodological guidelines of this Center and taking into account sanitary norms and rules for design and operation of lasers (M: In.-GOST 12.1.040-83 Laser Safety).

3. Research results and discussion
In the large-group cageular method of broiler chicken management, the concentration of exchange energy (EE) of diets varied depending on age and body weight (MJ/100g): 1.25 – on 0-10 day, 1.28 – on 11-20 day, 1.30 – on 21-33 day and 1.33 – on 34 day and before slaughter. The concentration of crude protein in combi feeds is inversely proportional to the increase in age and body weight of broilers, which varied from 21.74 in the first decade to 18.62% before their slaughter. The concentration of crude fat in diets ranged from 3.79 to 6.85% and raw fiber from 2.87 to 4.02%. The ratio of crude fat: crude
fat in diets ranged from 5.7:1 to 2.7:1, and the ratio of crude protein: raw fiber in them ranged from 7.6:1 to 4.6:1, which can be explained by increasing the proportion of the second in them, with the exception of raising poultry in the first decade.

When growing Hubbard cross broiler chickens under the conditions of a large-cage method of management, it is advisable to use the most effective, cheap, economically advantageous and physiologically useful biologically active complexes (BAC) for the body: Complevit, Selmevit, Biomax, which include fat and water-soluble vitamins, lipoic acid (1-2 mg), mineral microelements (Cu, Zn, Co, Mn, Fe), macroelements (Ca, Mg, P), amino acids methionine (100 mg).

The use of BAC alone and in combination with them in the ratio of 1:1 by weight, subjected to laser radiation in a spatial modulator (container), measuring 30x30 mm of porous white paper weighing 2.0 g, which are connected to two emitters simultaneously on the chest area of the broilers effectively outside the diets.

The consumption of the exchange energy of the diets per unit of the absolute average daily body weight of broiler chickens depending on the age and method of effect on the organism is as follows. For the age period of 1-4 days, the EE diets in three experiments ranged from 15.1 to 15.6 kcal/g versus 15.5 kcal/g in the control version. With the increase in the age period up to 5-15 days in the first experiment, this indicator ranged from 4.3 (Biomax, LLLR 8 sec) to 4.8 kcal/g (Complevit, LLLR 8 sec), while in the chicken of the control group it was 4.6 kcal/g.

Finally, when growing broiler chickens in the age period of 16-35 days during the experiment the consumption of EE diets depending on the dynamics of the body weight growth was as follows: in the first experiment – from 4.5 kcal/g (LLLR 8 sec, Selmevit) to 5.9 kcal/g (LLLR 8 sec, common group), the second – from 4.7 kcal/g (Biomax+Selmevit 1:1) and the third – from 4.9 kcal/g (LLLR 15 sec; 1:1) to 5.4 kcal/g (LLLR 15 sec (Complevit+Biomax 1:1 by weight) versus 5.9 kcal/g in the control.

For the entire intensive period of broiler growth of 35 days the consumption of EE diets depending on the dynamics of the body weight growth and the effect of the laser beam passed through various BAC (average), made for the first experiment – 8.2 kcal/g (LLLR 8 sec Selmevit) up to 8.7 kcal/g (LLLR 8 sec, Complevit), the second – 8.3 kcal/g (LLLR 8 sec in combination with all BAC) and third – from 8.2 kcal/g (LLLR 15 sec, Biomax+Selmevit) to 8.4 kcal/g (LLLR 15 sec, Complevit+Biomax) versus 8.6 kcal/g in the control variant.

The advantage of the studied BAC complexes outside poultry feeding is caused by the fact that they contain a complex of nutrients and biologically active substances in an optimal combination, which, when introduced into the body through an IR laser beam, even in very small quantities, cause a positive effect [10, 11, 14, 15].

Their pharmacological (therapeutic) effect is the more effective, the more fully preserved the combination of active principles, and the chemical (biochemical) compounds included in their composition, occupying the main positions in cageular and tissue metabolism, show the dominating effects on the functional state of a number of physiological and biological systems, on the reactivity of the body, its defense mechanisms, increasing the resistance of the broiler chicken body during the entire 35-day period of their growing [4, 5, 11, 17].

Taking into account the characteristics of diets and the effects of BAC laser radiation, it is necessary to identify a number of zootechnical and physiological parameters during the growth and slaughter of broilers.

Zootechnical and physiological parameters affecting the characteristics of diets and BAC during cultivation and slaughter of broilers are given in Table 1.

With an increase in massiveness (g/cm), there is a tendency to decrease the length of the intestine (cm), and in case of a decrease in massiveness, there is a tendency to increase the length of the intestine. In any case, when evaluating the studied zootechnical indicators in broiler chickens of the Hubbard cross grown under the conditions of a large-group cage management, the massiveness of the physique of meat chickens of this cross is back proportional to the length of the intestine.
Table 1. Impact of some exposure methods on a number of zootechnical indicators in the cultivation of Hubbard cross broilers

| Group of broiler chickens and method of treatment | Length of the intestine, cm | Diet weight (feed+water), kg | Diet weight, kg | Water body, kg | Intestine weight, g |
|-----------------------------------------------|----------------------------|-----------------------------|----------------|---------------|--------------------|
| **First scientific in-house experiment**       |                            |                             |                |               |                    |
| Control (general), BD (basic diet), water      | 0.78:1                     | 16.5:1                      | 46.2:1         | 25.7:1        | 1.33:1             |
| I experimental, BD, LLLR (8 sec, 3 W, 80 Hz) | 0.59:1                     | 14.8:1                      | 41.4:1         | 23.0:1        | 1.03:1             |
| II experimental, BD, LLLR (8 sec, 3 W, 80 Hz) Complexit | 0.64:1                   | 15.0:1                      | 41.9:1         | 23.3:1        | 1.02:1             |
| III experimental, BD, LLLR (8 sec, 3 W, 80 Hz) Selmevit | 0.64:1                   | 16.2:1                      | 45.3:1         | 25.1:1        | 1.04:1             |
| IV experimental, BD, LLLR (8 sec, 3 W, 80 Hz) Biomax | 0.62:1                   | 15.5:1                      | 43.5:1         | 24.1:1        | 1.00:1             |
| **Second scientific in-house experiment**      |                            |                             |                |               |                    |
| I experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit+Selmevit (1:1) | 0.70:1                   | 15.4:1                      | 43.1:1         | 23.9:1        | 1.19:1             |
| II experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit+Biomax (1:1) | 0.91:1                   | 18.3:1                      | 51.3:1         | 28.5:1        | 2.37:1             |
| III experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Biomax+Selmevit (1:1) | 0.71:1                   | 16.5:1                      | 46.3:1         | 25.7:1        | 1.61:1             |
| **Third scientific in-house experiment**       |                            |                             |                |               |                    |
| I experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit+Selmevit (1:1) | 0.73:1                   | 16.7:1                      | 46.7:1         | 25.9:1        | 1.30:1             |
| II experimental, BD, LLLR (8C, 3 W, 80 Hz), Complevit+Biomax (1:1) | 0.70:1                   | 14.8:1                      | 41.4:1         | 23.0:1        | 1.44:1             |
| III experimental, BD, LLLR (8C, 3 W, 80 Hz), Biomax+Selmevit (1:1) | 0.68:1                   | 15.9:1                      | 44.5:1         | 24.7:1        | 1.38:1             |

Such an indicator as the ratio of the massiveness of broilers (g/cm): intestine weight (g), when the studied active components exposed to a laser beam in the chest area (first experiment) were used separately varied in wide limits from 1.001:1 to 1.04:1. When a laser beam passed through various combinations of complexes of active components (1:1 by weight) with an exposure of 8 sec (second experiment), this indicator varied from 1.16:1 to 2.37:1, and in case of using the same combinations of complexes in the ratio of 1:1 (by weight), but with an exposure of 15 sec, it increased from 1.30:1 to 1.44:1, (third experiment) against 1.33:1 in the control.

In case the chest area was exposed to LLLR and in the absence of any active complexes, this was 1.03:1, i.e. at the same level as in the case of individual active component complexes.

It should be emphasized that the intestinal weight of broiler chickens at the age of 35 days in the first experiment ranged from 115 to 124 g, in the second – from 61.6 to 114 g, and in the third – from 81.7 to 102 g, while in the control group it was 99 g.
When improving the system for growing broilers of imported crosses, it is necessary to take into account not only the size, but also the weight of the intestine, especially when using laser technology in poultry meat production.

When controlling the nutritional status and costs of diet feed per unit of production (conversion), it is advisable to identify the dynamics of body weight distribution depending on the length of the body of broiler chickens in the conditions of the existing meat production complex.

The broiler chicken weight index now looks against the background of accounting for consumed feed and drunk water within 7.950 kg for 35 days of their cultivation. Such indicator as massiveness (g/cm): diet weight (feed+drinking water) (kg), during specific growing periods ranged in the following limits: in the first experiment – from 14.8: 1 to 16.2:1, in the second – from 15.4:1 to 18.3:1 and in the third – from 14.8:1 to 16.7:1 against 16.5:1 in the control group. For all periods of growing and feeding the broilers consumed only 2850 g of full-diet feed and 5130 g of drinking water per head, a total of 7980 g for each experimental and control group.

The slaughter yield of broiler chickens of experimental groups ranged from 69.1 to 86.9% against 68.9% in the control. A relatively high slaughter yield is established using Selmevit (78.2±0.39%) both separately and in combination – Selmevit+Biomax (82.8 ± 0.68%) with the radiation exposure of 8 sec, as well as (83.8±1.01%) – 15 sec.

It should be noted that the use of different complexes of active components both separately and in combination with each other, and when passed through the beam of the semiconductor laser Pattern-2K-super in the chest area, did not have a negative effect on the functional features of the internal organs – liver, heart and stomach.

After slaughter of broiler chickens, all the corresponding measurements were presented, which are shown in Table 2.

Thus, for example, the length of the body of broilers grown under the conditions of a large-group cage method of management in a modern fundamentally new complex that does not have analogues in domestic and foreign meat poultry ranged from 17.0±0.48 to 19.0±0.54 cm (P<0.001). The relatively low length of the body was noted in the broilers of the control group (15.0±0.81 cm) and when using complexes of active components in the form of Complevit+Biomax in the ratio of 1:1, equal to 15.2±0.10 cm. These complexes exposed to a laser beam with an exposure of 8 sec did not contribute to the growth of the body length. Although in other cases, the growth trend of this measure was 2-4 cm, which is 13-27% higher than in the control group.

The chests of broiler chickens ranged from 20.5±0.65 cm using Selmevit (P<0.001) to 22.6±0.50 cm (P<0.001) when simultaneously using Complevit+Biomax (1:1) with an exposure of 15 sec, while in the control group this indicator was 17.3±0.07 cm. An almost similar indicator equal to 17.7±0.94 cm was noted when exposed to LLLR and absence of any BAC.

As for the chest girth, it ranged from 27.0±0.50 to 33.5±4.08 cm (P<0.05) and varied widely: in the first experiment – from 29.0±0.18 cm (P<0.05) to 30.7±0.60 cm (P<0.05), in the second – from 27.0±0.50 to 28.8±17.2 cm, in the third – from 28.0±1.54 to 33.5±4.08 cm. At the same time, this figure in the control group was 27.2±0.73 cm, i.e. it was slightly lower than in the analogues of all experimental groups.

It should be noted that the effect of LLLR in the chest area with the exposure of 8 sec has a beneficial effect on the increase in chest girth – up to 30.0±1.08 cm (P<0.05) or by 10.3% compared to the control. However, the same LLLR effect did not have a significant effect on chest width growth.

Therefore, in order to increase the chest girth, the body of broilers needs to undergo LLLR IR-range in the chest area.

The experimental data indicate that the intestinal length of broiler chickens at the age of slaughter (35 day) ranged from 160±10.90 to 203±9.23 cm against 169±19.36 cm in the control. The increase in the length of the intestines to 40 cm in the broilers of experimental groups is mainly explained by increasing the digestibility of not only crude protein, but also crude fat, and raw fiber, as well as the LLLR effect on the body.
It was established that with an increase in the length of the intestine, it is possible to slow down the migration of humidified fodder weight through the gastrointestinal tract due to enrichment of its certain “areas” with fermented organic substance, etc., which ultimately contributed to a decrease in the content of toxic substances, gases, metabolic products and their degradation in the body, an increase in the body weight in the shortest time by biostimulation of digestive processes and metabolism.

The length of the large intestine in meat chickens during cultivation ranged from 10.0±0.70 to 13.3±2.42 cm depending on the method of exposure to the body, while in the control group it was 12.0±1.88 cm (Table 2).

When modernizing the poultry meat production complex, it is necessary to take into account such an indicator as the diet weight (feed+water, g): intestine length (cm). This indicator is needed for systematic full-fledged control of feed consumption, nutrient digestibility of diets and digestibility of biologically active substances by the body.

With the current system of growing broiler chickens, this indicator (ratio) varied widely, namely: in the first experiment – from 39.3:1 to 43.7:1, in the second – from 42.9:1 to 49.9:1, in the third – from 42.9:1 to 47.5:1 against 47.2:1 in the control (Table 3).
Table 3. Effect of diet mass on some zootechnical and physiological indicators when using LLLR in broiler chickens

| Group of broiler chickens and method of treatment | Diet weight (feed+water, g): Intestine length | Diet weight (g) without water: Intestine weight (g): Intestine length (cm) | Water body (separately) in a diet (g): Broiler body weight (g): Large intestine length (cm) | Feed weight+water in a diet (g): Large intestine length (cm) | Water body (separately) without water (g): Intestine length (cm) | Total feed consumed over 35 days, g/head | Total water drunk over 35 days, g/head |
|--------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------|---------------------------------------------|
| **First scientific in-house experiment**          |                                            |                                                                  |                                                                     |                                                             |                                                             |                                                             |                                                             |
| Control (general), BD (basic diet), water         | 47.2:1                                     | 28.2:1                                                         | 30.3:1                                                             | 4.0:1                                                       | 237.5:1                                                    | 427.5:1                                                    | 16.9:1                                                    | 2850                                        | 5130                                        |
| I experimental, BD, LLLR (8 sec, 3 W, 80 Hz), general | 39.9:1                                     | 24.8:1                                                         | 25.6:1                                                             | 4.0:1                                                       | 259.0:1                                                    | 466.4:1                                                    | 14.2:1                                                    | 2850                                        | 5130                                        |
| II experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit | 42.7:1                                     | 24.3:1                                                         | 27.4:1                                                             | 3.9:1                                                       | 237.0:1                                                    | 427.5:1                                                    | 15.2:1                                                    | 2850                                        | 5130                                        |
| III experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Selmevit | 39.3:1                                     | 23.0:1                                                         | 25.3:1                                                             | 3.4:1                                                       | 219.2:1                                                    | 394.6:1                                                    | 14.0:1                                                    | 2850                                        | 5130                                        |
| IV experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Biomax | 39.9:1                                     | 23.1:1                                                         | 25.6:1                                                             | 3.8:1                                                       | 219.2:1                                                    | 394.6:1                                                    | 14.2:1                                                    | 2850                                        | 5130                                        |
| **Second scientific in-house experiment**         |                                            |                                                                  |                                                                     |                                                             |                                                             |                                                             |                                                             |                                                             |                                                             |
| I experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit+Selmevit (1:1) | 45.3:1                                     | 27.7:1                                                         | 29.1:1                                                             | 3.4:1                                                       | 237.5:1                                                    | 427.5:1                                                    | 16.1:1                                                    | 2850                                        | 5130                                        |
| II experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit+Biomax (1:1) | 49.9:1                                     | 46.3:1                                                         | 32.1:1                                                             | 3.6:1                                                       | 237.5:1                                                    | 427.5:1                                                    | 17.8:1                                                    | 2850                                        | 5130                                        |
| III experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Biomax+Selmevit (1:1) | 42.9:1                                     | 25.0:1                                                         | 27.6:1                                                             | 3.5:1                                                       | 219.2:1                                                    | 394.6:1                                                    | 15.3:1                                                    | 2850                                        | 5130                                        |
| **Third scientific in-house experiment**          |                                            |                                                                  |                                                                     |                                                             |                                                             |                                                             |                                                             |                                                             |                                                             |
| I experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit+Selmevit (1:1) | 43.8:1                                     | 27.9:1                                                         | 28.2:1                                                             | 3.5:1                                                       | 219.2:1                                                    | 394.6:1                                                    | 15.6:1                                                    | 2850                                        | 5130                                        |
| II experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Complevit+Biomax (1:1) | 47.5:1                                     | 34.9:1                                                         | 30.5:1                                                             | 3.7:1                                                       | 285.0:1                                                    | 513.0:1                                                    | 16.9:1                                                    | 2850                                        | 5130                                        |
| III experimental, BD, LLLR (8 sec, 3 W, 80 Hz), Biomax+Selmevit (1:1) | 42.9:1                                     | 30.9:1                                                         | 27.6:1                                                             | 3.7:1                                                       | 237.5:1                                                    | 427.5:1                                                    | 15.3:1                                                    | 2850                                        | 5130                                        |

Thus, for each centimeter (cm) of intestinal length, from 39.3 to 43.7 g of feed+water (diet) are accounted for in case of using the studied complexes of active ingredients in the first experiment. The use of laser beam passed through complexes (Complevit+Selmevit; Complevit+Biomax; Biomax+Selmevit, 1:1) with an exposure of 8 sec, led to an increase from 42.9 to 49.9 g of feed consumption per unit intestinal length in the second experiment. Finally, using similar complexes of active components with an exposure of 15 sec, this value ranged from 42.9 to 47.5 g against 47.2 g in the control (in the third experiment).

Such ratio as feed weight+water in the diet (g): body weight (g) ranged from 3.4:1 to 4.0:1 depending on the method of exposure to LLLR in the chest area and the use of different one- and two-complex active components. A similar indicator was found in the control group, namely 4.0:1. As a result, it was
found that for each gram of the body weight there are from 3.4 to 4.0 g of diet (feed+water), depending on the dynamics of the body weight of broilers before slaughter at the age of 35 days.

For all the periods of growing and feeding broiler chickens per 1 head, a total of 2850 g of full-feed feed was consumed and 5130 g of water was drunk. As a result, the weight of the diet is 7980 g (on average for each broiler), and its juiciness is 1.8.

Therefore, with the established complex for the production of poultry meat, the technology of growing broiler chickens using optimal recipes for full-diet feed at the present time corresponds to a juicy diet of 1.8.

In conditions of keeping and feeding broiler chickens of the Hubbard cross, with a large-cage method of management, it is necessary to apply the Novgorod Method for the intestinal tract more widely. This method is closely related to the use of domestic semiconductor infrared lasers, is highly efficient, does not require any additional costs, as well as feed (products) of diets for 35 days of broiler cultivation; all studied complexes of active components do not fall into daily feeding diets, i.e. into the oral cavity of a bird. They are (contained) in a spatial modulator of the laser itself and act through the laser beam into the chest area stimulating physiological processes, increasing the length of the intestine and the body weight of broilers.

4. Conclusion
The potentials of each nutrient and biologically active substance, both separately and in combination with others, in the composition of the daily diet are not limitless. The energy reserves of plant and animal feed in combination with mineral, vitamin and other additives in the diet system of broiler chickens need a separate (“forced”) effect in the form of a “push” on the tissues of a healthy, sometimes weakened organism to strengthen metabolic processes.

Used BACs – Complevit, Selmevit and Biomax both separately and in combination in a ratio of 1:1 (by weight) passed through a semiconductor laser beam of the IR range with minimal parameters in the chest area increased the functional features of immunity, hematopoiesis. Digestion, growth, development, feed efficiency, fattening and meat quality; and the Novgorod Method of “training” the intestine using a domestic laser does not require any additional financial resources, feed products during the intensive cultivation of broiler chickens.

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