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Probiotic feed addition influence on slaughter qualities of broiler chickens grown in a cage battery

“Protecto-Active” feed addition with probiotic action positive influence on slaughter qualities of the broiler chickens grown in a cage battery is ascertained. The use of the probiotic feed addition of in the technological process of broiler chickens growing promotes their preslaughter live mass by 3,0-3,5%, the semiembowled and emboweled carcass weight by 2,9-3,7 and 3,3-4,2%, and the emboweled carcass output – by 0,4-0,5%, pectoral muscles weight by 5,1-7,1% in the experience chickens compared with the control. Thus, adding probiotic “Protecto-Active” feed addition to the mixed fodders provided increase in the experimental groups broiler chickens pectoral fleshiness index by 0,7-0,9% and decline of boninessindex by 0,4-0,6% as compared with those of the control group (27,9 and 19,8%).

Broiler chickens, probiotic, preslaughter living mass, slaughter output, carcass weight

Poultry growing plays a considerable role in providing the world population with high-quality food products. The personal interest to this industry of agriculture is supported by well-known technological and economic advantages: low charges of forage, short breeding term, high quality of the products [1].

To obtain quality and safe products of stock-raising and poultry growing use of antibiotics-growth factors in farm animals and poultry raising was prohibited according to the UE Parliament from January, 1, 2006 [2]. The search of alternative safe and effective promoting agent is being conducted nowadays.

The issue of poultry growth stimulation and of feed activity increase is of significant zootechnic, veterinary and economic value [3, 4]. In the last few years much information on the positive influence of probiotic preparations on the poultry organism has been accumulated lately [5]. Taking it into account, the numerous probiotics of both foreign and home production appear at the market among which the national Protecto-Active probiotic feed addition is presented.

Probiotic preparations should stimulate broiler chickens growth and provide economic efficiency of their use, however, it can only be positive in case, when the slaughter products will be safe in terms of human health [6, 7].

It is proven that living mass, age, growth intensity and ration contents influence broilers meat quality. Hereby, the use of some growth factors, depending on the direction of their action, can change significantly slaughter qualities and morphological composition of carcasses.

The aim of work was to research the influence of Protecto-Active probiotic feed addition on slaughter

qualities of the broiler chickens grown in a cage battery.

Research materials and methods. Scientific economic experiment with the use of Protecto-Active probiotic preparation in the technological process of growing broiler chickens was conducted on the facilities of Bila Tserkva National Agrarian University Vivarium. Six groups were formed on the principle of analogues from a day old chickens of Ross-308 cross, each amounted 100 chickens: one control and 5 experience ones. The broilers were kept in a TBTsU-4 “Tekhna” cage battery. The control group of broilers was fed with the standard full ration mixed fodder, all the experimental groups, along with the mixed fodder, got probiotic Protecto-Active feed in accordance with the chart presented in a table 1.

To determine anatomic and morphological composition of the carcasses at the end of the experiment we carried out the control slaughter of broiler chickens. The slaughter was conducted by an external one-sided method. Five chicks with the average live weight were selected for slaughter from each group. The anatomic and morphological dissection of the broilers carcasses was conducted according to methodology [8].

Chickens slaughter weight was determined by their weighing on the scales of VNTs and VLKT-500. On the basis of the data, obtained after anatomic and morphological dissection, the indices of meat quality were determined (by Gintse formulas).

Research results and their discussion. An anatomic dissection and slaughter indices 42 days old chickens, grown in a cage battery showed that applying Protecto-Active probiotic feed addition caused, apart from increase in preslaughter live weight, quantitative

1. Experiment Chart

Age, days	Group					
	I – control	II	III	IV	V	VI
1-5	BR	BR+2 kg/t	BR+2 kg/t	BR+2 kg/t	BR+2 kg/t	BR+2 kg/t
6-10	BR	BR+2 kg/t	BR+2 kg/t	BR+2 kg/t	BR	BR
11-15	BR	BR+1 kg/t	BR	BR	BR	BR
16-20	BR	BR+1 kg/t	BR	BR	BR+1 kg/t	BR
21-25	BR	BR+1 kg/t	BR+1 kg/t	BR	BR	BR+1 kg/t
26-30	BR	BR+1 kg/t	BR	BR+1 kg/t	BR	BR
31-35	BR	BR+0,5 kg/t	BR	BR	BR+0,5 kg/t	BR
36-42	BR	BR+0,5 kg/t	BR	BR	BR	BR

2. Slaughter qualities of broiler chickens grown in a cage battery (n=5)

Index	Group					
	I	II	III	IV	V	VI
Before-slaughter live weight, g	2291,6 ±21,34	2371,6 ±12,61*	2366,6 ±11,69*	2360,2 ±12,47*	2351,4 ±12,77	2354,4 ±15,04
Semiemboweled carcass weight, g	1969,2 ±17,59	2042,0 ±10,52*	2035,6 ±11,91*	2031,8 ±12,01*	2025,6 ±11,52*	2027,2 ±14,78
Emboweled carcass weight, g	1692,4 ±17,05	1763,6 ±10,30*	1757,6 ±11,25*	1754,0 ±11,61*	1747,8 ±12,22*	1749,6 ±14,79
Semiemboweled carcass output, %	85,9 ±0,18	86,1 ±0,10	86,0 ±0,12	86,1 ±0,07	86,1±0,07	86,1 ±0,10
Emboweled carcass output, %	73,9 ±0,15	74,4 ±0,10*	74,3 ±0,11	74,3 ±0,13	74,3 ±0,16	74,3 ±0,16
Pectoral muscles, g	472,4 ±4,82	496,4 ±4,23*	506,0 ±2,40**	497,0 ±2,44**	502,4 ±4,35**	500,8 ±4,57**
Femoral and tibial muscles, g	423,6 ±7,50	452,8 ±3,79*	444,8 ±2,87*	447,8 ±4,98*	441,4 ±2,78	445,2 ±4,19
Mass: – skins, g	197,4 ±1,89	198,8 ±2,01	199,2 ±2,58	198,8 ±2,96	198,8 ±2,58	199,4 ±4,83
– viscelar fat, g	42,8 ±0,86	43,0 ±1,30	41,4 ±0,60	41,8 ±1,11	41,6 ±0,93	41,8 ±0,58
– liver, g	47,0 ±0,55	47,4 ±0,51	47,6 ±0,51	47,2 ±0,58	47,4 ±0,60	47,4 ±0,68
– muscular stomach, g	25,2 ±0,20	25,4 ±0,37	25,2 ±0,24	25,4 ±0,32	25,2 ±0,37	25,4 ±0,32
– heart, g	15,8 ±0,32	16,2 ±0,24	16,0 ±0,37	15,8 ±0,37	16,2 ±0,24	16,0 ±0,24

Note: * – $P < 0,05$ – as compared with the control group 1, ** – $P < 0,01$ – as compared with the control group 1.

changes in correlation of edible parts of chickens carcasses of the experimental and control groups (table 2).

The studies reveal that preslaughter live weight of groups 2, 3 and 4 broiler chickens is higher than that of group 1 (control) (2291,6 g) by 3,5; 3,3 and 3,0% ($P < 0,05$). In groups 5 and 6 there is a tendency to

increase live weight by 2,6 and 2,7% as compared with the control (table 2).

Weight of semiemboweled and emboweled carcasses in group 1 (control) made 1969,2 g and 1692,4 g that is definitely lower than these indices by 3,7 and 4,2%; by 3,4 and 3,9%; by 3,2 and 3,6% and by 2,9 and 3,3% in

3. Broilers chickens grown in a cage battery carcass meat qualities indices (n=5)

Index	Group					
	I	II	III	IV	V	VI
Carcass Meat, %	65,2	66,3	66,2	66,2	66,0	66,0
Pectoral meat, %	27,9	28,1	28,8	28,3	28,7	28,6
Legs Meat, %	25,0	25,7	25,3	25,5	25,3	25,4
Edible parts, %	84,6	85,0	84,9	84,9	84,9	84,9
Boniness, %	19,8	19,2	19,3	19,3	19,4	19,4

Note: * – $P < 0,05$ – as compared with the control group 1, ** – $P < 0,01$ – as compared with the control group 1.

groups 2, 3, 4 and 5 accordingly.

The semiemboweled carcass output in the experimental groups of chickens grown in a cager battery is in the range of 85,9-86,1%, no statistically reliable difference between the experimental and a control group is revealed. An emboweled carcass output in chickens of group 2 was 0,5% higher than in group 1 (control) (73,9%) and made 74,4%. For broiler chickens groups 3, 4, 5 and 6 there is a tendency to the increase of the emboweled carcass output by 0,4% as compared with the control.

The research has found out, that pectoral muscles weight in the carcasses of chickens of the group 1 (control) (472,4 g) exceeds those of all the experimental ones: by 5,1% in group 2 ($P < 0,05$); by 7,1% in group 3; by 5,2% – in group 4, by 6,4% – in group 5 and 6,0% in group 6 ($P < 0,01$).

Limbs (femoral and tibial) muscles of the broiler chickens of 2, 3 and 4 groups is by 6,9; 5,0 and 5,7% ($P < 0,05$) higher and for chickens of 5 and 6 groups a tendency to the increase of this index by 4,2 and 5,1% as compared with group 1 (control) (423,6 g) is observed.

The conducted anatomic and morphological dissection of the carcasses of the broilers grown in cages has found out, that skin weight of the experimental groups chickens fluctuates in the range of a 197,4-199,4 g and does not differ significantly from the experimental groups. No significant difference is revealed in visceral fat and internal organs of the control and experience groups chickens. Thus, internal fat weight in the broilers grown in cages fluctuates in the range of 41,4-43,0 g, liver weight is 47,0-47,6 g, muscular stomach weight – 25,2-25,4 g and heart weight is 15,8-16,2 g.

The conducted research reveals that meat qualities indices of broiler chickens carcasses change in accordance with the changes of edible nonedible parts in the broilers carcass (table 3).

Thus, under growing broilers in a cage battery the carcass meat index of the control group chickens is 65,2% while in the experimental groups a tendency to

the increase of this index by 0,8-1,1% is observed, though no significant difference is revealed.

The highest breast meat index is observed in the carcasses group 3 chickens (28,8%), that is by 0,9% ($P < 0,01$) higher than in the control (27,9%). Also in the carcasses of broilers of groups 5 and 6 the breast meat index is significantly higher than in group 1 (control) – by 0,8% ($P < 0,01$) and by 0,7% ($P < 0,05$) accordingly. No statistically reliable difference is observed in this index in the carcasses of groups 2 and 4 chickens as compared with the control.

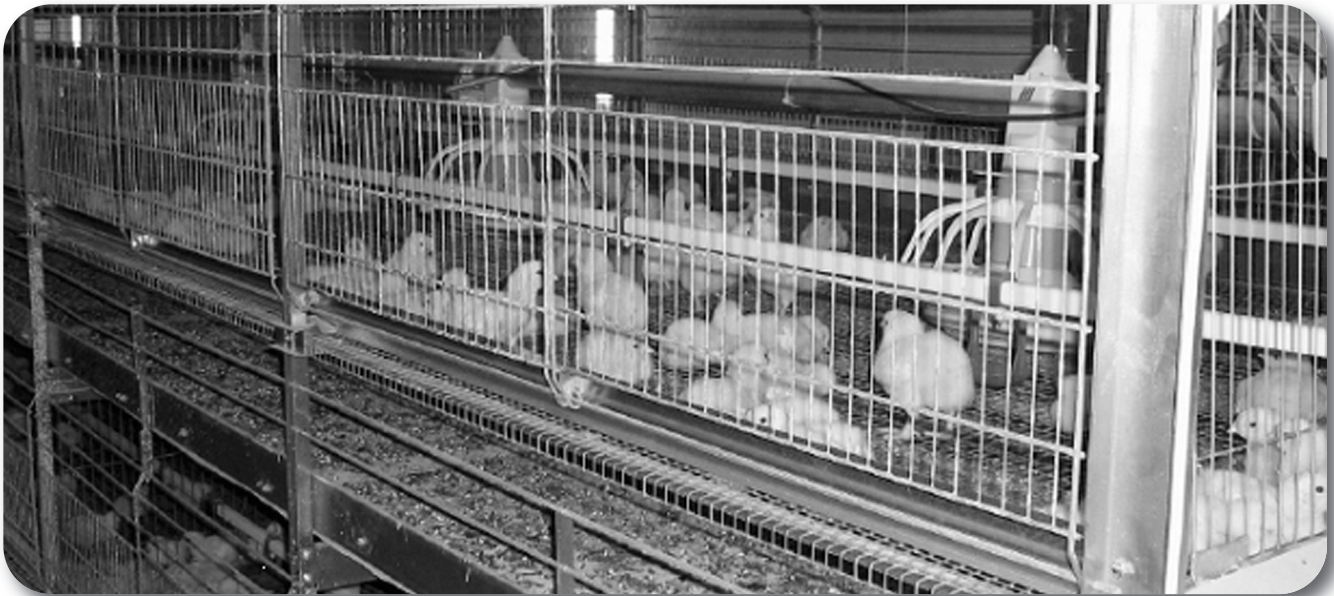
The research reveal that legs meat index and edible parts index were ranged within 25,0-25,7% and 84,6-85,0% accordingly. Statistically reliable difference between these indices in the carcasses of chickens of group 1 (control) and 2, 3, 4, 5, 6 groups was not revealed though a tendency to the increase of these indices in the the experimental groups broilers carcasses is observed.

Boniness index of the carcasses of the experimental groups 2, 3, 4, 5, 6 broiler chickens is lower than in group 1 (control) (19,8%) by 0,6% ($P < 0,01$), 0,5%, 0,5% and 0,4% ($P < 0,05$).

Conclusions

1. Using Protecto-Active probiotic feed addition in the technological process of growing broiler chickens in cage batteries promotes increase of preslaughter live weight by 3,0-3,5%, semiemboweled and emboweled carcasses weight – by 2,9-3,7% and 3,3-4,2% accordingly, disemboweled carcass output increase – by 0,4-0,5%, pectoral muscles weight – by 5,1-7,1% as compared with the indices of the control group chickens.

2. Changes of poultry meat qualities indices are observed with the changes of broiler chickens carcass component parts. Thus, adding Protecto-Active probiotic according to the experiment chart provided increase in breasts meat index of the experimental groups broiler chickens by 0,7-0,9% and decrease in boniness index



by 0,4-0,6% as compared with the control group indices (27,9 and 19,8%).

Встановлено позитивний вплив кормової добавки з пробіотичною дією “Протекто-Актив” на забійні якості курчат-бройлерів, вирощених у клітковій батареї. Використання пробіотичної кормової добавки в технологічному процесі вирощування курчат-бройлерів підвищує передзабійну живу масу на 3,0-3,5%, масу напівпатраної та патраної тушок на 2,9-3,7% і 3,3-4,2%, вихід патраної тушки на 0,4-0,5%, масу грудних м’язів на 5,1-7,1% дослідної птиці порівняно з контролем. Так, додавання до комбікормів пробіотики “Протекто-Актив” сприяло підвищенню у курчат-бройлерів дослідних груп індексу м’ясності грудей на 0,7-0,9% та зниженню індексу костистості на 0,4-0,6% порівняно з даними індексами контрольної групи (27,9 та 19,8%).

Курчата-бройлери, пробіотик, передзабійна жива маса, забійний вихід, маса тушки.

Установлено положительное влияние кормовой добавки с пробиотическим действием “Протекто-Актив” на убойные качества цыплят-бройлеров, выращенных в клеточной батарее. Использование пробиотической кормовой добавки в технологическом процессе выращивания цыплят-бройлеров повышает предубойную живую массу на 3,0-3,5%, массу полупотрошенной и потрошенной тушек на 2,9-3,7% и 3,3-4,2%, выход потрошенной тушки на 0,4-0,5%, массу грудных мышц на 5,1-7,1% опытной птицы по сравнению с контролем. Так, добавление к комбикормам пробиотика “Протекто-Актив” способствовало повышению у цыплят-бройлеров опытных групп индекса мясности груди на 0,7-0,9% и снижению индекса костистости на 0,4-0,6% по сравнению с этими индексами контрольной группы (27,9 и 19,8%).

Цыплята-бройлери, пробиотики, предубойная живая масса, убойный выход, масса тушки.

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