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Antiviral activity of trifuzol for the broiler at poultry farm

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Key words: Trifuzol, Infectious Bronchitis Virus, Infectious Bursal Disease Virus, Newcastle Disease, Vaccination.

The birds diseases in the modern poultry industry have a negative impact on economic development of poultry business, as it causes poor assimilation of food and consequently, slow weight gain in broilers and reduce the number and quality of eggs from hens. Thus the economic costs of this are usually much higher than from mortality [1,6,8,9].

The aim of research was to test the efficiency of the trifuzol vaccinations against viral diseases in growing broilers.

Methods and results. Production tests of trifuzol impact on the effectiveness of vaccination against viral diseases and broiler production indexes when growing broilers were performed on the experimental group, which did not receive trifuzol (20.000 heads) And a control group that received 1% trifuzol solution 0.5 ml per 10 kg body weight for 3 days in a row for 7–9 days birth poultry (19.000 heads).

The test systems of the Biochek company were used for the detection of antibodies to the ICC and ICC ELISA, and set for hemagglutination delay reaction (Russia) was used for the detection of antibodies to Newcastle virus.

Conclusions. It was established that the level of protective antibodies during vaccination IBD matches the basic norm, however, the vaccination index (VI) in the control group was 1.5 times higher. The average antibody titer to the NH virus when using trifuzol was 5 log₂, and group immunity was 87.5% which corresponds to the basic norms of vaccination in NH. The European efficiency factor in the experiment was 5% higher than in the control group.

Противірусна активність препарату трифузол при вирощуванні бройлерів на птахопідприємстві

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Захворювання птахів в умовах сучасного птахівництва чинять негативний вплив на економічний розвиток птахопідприємства, бо викликають погане засвоєння корму і, як наслідок, – уповільнення набору ваги у бройлерів, а також зменшення кількості та якості яєць у несучок. Отже, економічні втрати від цього, зазвичай, значно вищі, ніж від смертності [1,6,8,9]. Мета дослідження – випробування препарату трифузол на ефективність вакцинацій проти вірусних захворювань під час вирощування бройлерів. Виробничі випробування впливу трифузолу на ефективність вакцинації проти вірусних захворювань бройлерів і на виробничі показники при вирощуванні бройлерів здійснили на дослідній групі, котра не отримувала трифузол (20000 голів), і контрольній групі, що отримувала 1% розчин трифузолу в розрахунку 0,5 мл на 10 кг живої ваги протягом 3 днів поспіль на 7–9 добу народження птиці (19000 голів). Для визначення антитіл до ІБХ та ІБК методом ІФА використали тест-системи фірми BioChek, а для виявлення антитіл до вірусу ньюкаслської хвороби – набір для реакції затримки гемаглютинації (Російська Федерація). Встановили, що рівень протективних антитіл при вакцинації ІБК відповідав базовій нормі, однак індекс вакцинації (ІВ) у контрольній групі був вищим в 1,5 раза. Середній титр антитіл до вірусу НХ при застосуванні трифузолу – 5 log₂, а груповий імунітет становив 87,5%, що відповідає базовим нормам вакцинації при НХ. Європейський коефіцієнт ефективності у досліді був на 5% вищим, ніж у контрольній групі.

Ключові слова: трифузол, інфекційний бронхіт курей, інфекційна брусальна хвороба, ньюкаслська хвороба, вакцинація.

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Противовирусная активность препарата трифузол при выращивании бройлеров на птицефабрике

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Заболевания птиц в условиях современного птицеводства оказывают негативное влияние на экономическое развитие птицефабрик, так как вызывают плохое усвоение корма и, как следствие, замедление набора веса у бройлеров, а также уменьшение количества и качества яиц у несушек. Таким образом, экономические потери от этого обычно значительно выше, чем от смертности [1,6, 8,9]. Цель исследования – испытания препарата трифузол на эффективность вакцинации против вирусных заболеваний при выращивании бройлеров. Производственные испытания влияния трифузола на эффективность вакцинации против вирусных заболеваний бройлеров и на производственные показатели при выращивании бройлеров проводили на опытной группе, которая не получала трифузол (20000 голов) и контрольной группе, получавшей 1% раствор трифузола в расчёте 0,5 мл на 10 кг живого веса в течение 3 дней подряд на 7–9 сутки рождения птицы (19000 голов). Для определения антител к ИБХ и ИСК методом ИФА использовали тест-системы фирмы BioChek, а для выявления антител к вирусу ньюкаслской болезни – набор для реакции задержки гемагглютинации (Российская Федерация). Установлено, что уровень протективных антител при проведении вакцинации ИБК отвечал базовой норме, но индекс вакцинации (ІВ) в контрольной группе был выше в 1,5 раза. Средний титр антител к вирусу НБ при применении трифузола был 5 log₂, а групповой иммунитет составил 87,5%, что соответствует базовым нормам вакцинации при НХ. Европейский коэффициент эффективности в опыте был на 5% выше, чем в контрольной группе.

Ключевые слова: трифузол, инфекционный бронхит кур, инфекционная брусальная болезнь, ньюкаслская болезнь, вакцинация.

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The birds diseases in the modern poultry industry have a negative impact on economic development of poultry business, as it causes poor assimilation of food and consequently, slow weight gain in broilers and reduce the number and quality of eggs from hens. Thus the economic costs of this are usually much higher than from mortality [1,6,8,9].

There are some new for our country diseases which include metapneumovirus, infectious bronchitis of hens (IBH), which is caused by a variant strain of IBK. Newcastle disease (NH), infectious laryngotracheitis, infectious bird flu brusal disease (IBD), etc do not lose relevance today. [1,6,8,9].

The practice of frequent change of the vaccination schemes, the spectrum of drugs, unjustified introduction of the new vaccination schemes and the use of live vaccines produced on the basis of «hot» and variant strains, and the use of polystrain vaccines leads to the expansion of the range of microorganisms circulating in the farm. Vaccination of the weak birds and birds which are located in immunosuppressive condition infected by any pathogen leads to the virulence increasing of the field virus and causes subclinical infection passing in the background vaccine [1]. Therefore, the development and search of highly efficient antiviral agents that stimulate the immune system is an important task in the development of veterinary medicine.

The aim of research was to test the efficiency of the trifuzol vaccinations against viral diseases in growing broilers.

Materials and methods

Production tests of trifuzol were conducted on the vaccinations effectivity against viral diseases in growing chickens cross ROSS-308 (AC) on poultry farm FG «Simbirskaya Poultry» Simbirsk district, Lviv region.

The vaccination of broilers was conducted by the following scheme: experimental and control groups were vaccinated at the same time in days age against IBCH/NH; against bronchitis infectious (IBH) – in the 10 days age by the Sevak vaccine Ibird (a strain variant of «1/96»), Hungary; against bursal diseases (IBD) once at the 12-days age by the IBD L Sevak vaccine

(strain Vinterfeld 2512G61), Hungary; against Newcastle disease (NH) – in the 14-days age and again at the 24 days age by the vaccine Cevac® NEW L.

The test systems of the BioShek company were used for the detection of antibodies to the ICC and ICC ELISA, and set for hemagglutination delay reaction (Russia) was used for the detection of antibodies to Newcastle virus.

Technological parameters of broiler growing (temperature and light conditions, planting density) were sustained according to ONTP – 2005. The feeding was carried out according to the standards recommended for cross ROSS-308.

Production tests of trifuzol impact on the effectiveness of vaccination against viral diseases and broiler production indexes when growing broilers were performed on the experimental group, which did not receive trifuzol (20.000 heads) And a control group that received 1% trifuzol solution 0.5 ml per 10 kg body weight for 3 days in a row for 7–9 days birth poultry (19.000 heads).

The immunity tension was determined at 44–45 days before IBH and IBD by ELISA method, to NH was determined by the reaction of hemagglutination delays (RHAD) [5]. At the same time it was noted the clinical condition of the bird, the retention percentage, weight gain and feed costs.

To evaluate the variability of the object study we have calculated the coefficient of variation (% CV) [3]. And to estimate the parameters we have calculated the vaccination index (VI) [2].

The obtained data was statistically processed using the standard software package Microsoft Office 2007 and «STATISTICA® for Windows 6.0». Reliability of the intergroup differences in experimental data set using Student t-test. The level of statistical significance of research results differences – $p < 0.05$ [4,7].

Results and discussion

The test results of the trifuzol impact on the vaccination effectiveness against viral diseases of broilers are shown in the Table 1.

Table 1

The trifuzol influence on the vaccination effectiveness of the broilers against IBH, IBD and NH (n=25)

№	Group	Indexes		
1	IBH	Control	Average titer, c.u., $M \pm m$	7247±275.4
2			%CV, %	19
3			IB, c.u.	381.42
4		Experimental	Average titer, c.u., $M \pm m$	5698±341.9*
5			%CV, %	30
6			IB, c. u.	189.93
7	IBD	Control	Average titer, c.u., $M \pm m$	6423±629.5
8			%CV, %	49
9			IB, c.u.	131.1
10		Experimental	Average titer, c.u., $M \pm m$	5032±593.8
11			%CV, %	59
12			IB, c.u.	85.3
13	NH	Control	Average titer, \log_2	3
14			Group immunity, %	33.4
15		Experimental	Average titer, \log_2	5
16			Group immunity, %	87.5

Note: * – the data is statistically significant regarding to the control group, $p < 0.01$.



Data of the production indicators in broilers growing

Indexes	Units	Experiment	Control
Number of heads during the landing	head	19000	20000
Live weight in 44–45 days	g	2525	2573
Weight of the body	g	1883.6	1906.5
Slaughter output	%	74.6	74.1
Died	%	3.73	4.65
The average increase	g	60.1	60.5
Survival	%	96.27	95.35
Feed conversion	units	1.86	1.8
European efficiency factor	units	311.2	296.3

After analyzing the obtained data in the combined use of the trifuzol and vaccine against IBH it was found that the average titers of specific antibodies to the IBH virus was at protective level as well as the control and experimental groups. However, in the case of the titer varying in the control group was average, and in the case of the experimental group significant (% CV=30), which is 1.6 times higher. It should also be noted that differences in the results of the control and experimental group were statistically significant ($p < 0.01$).

Average titers of antibodies to the virus IBK in both groups were at projective level, however, the vaccination index (VI) in the control group was 1.5 times higher. It is also noted considerable variability in data research results in the control and experimental groups (% CV=49 and 59 respectively).

After the broiler vaccination to the HX virus the average antibody titer was $5 \log_2$ after trifuzol application, while in control it was $3 \log_2$, and the group immunity in experiment was 87.5%,

while the control was 33.4%, which does not match the normally vaccination in basic.

Production indexes in broilers growing showed (Table 2) that saving poultry in the experimental group were higher at 0.92% compared with the control group, and the european efficiency factor in the experiment was 311.6 units and was higher in the experimental group 14.9 units that is by 5% compared with the control.

Conclusions

1. The level of protective antibodies during vaccination IBD matches the basic norm, however, the vaccination index (VI) in the control group was 1.5 times higher.

2. The average antibody titer to the NH virus when using trifuzol was $5 \log_2$, and group immunity was 87.5% which corresponds to the basic norms of vaccination in NH.

3. The European efficiency factor in the experiment was 5% higher than in the control group.

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