ISSN: 2053-3578 I.F. 12.34

EFFECTIVE IMMUNOPROPHYLAXIS OF POULTRY NEWCASTLE DISEASE AT INDUSTRIAL FEEDING OF BROILER CHICKENS IN COUNTRIES WITH HOT CLIMATIC CONDITIONS

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Annotation. The article shows effective immunoprophylaxis of Newcastle disease in broiler chickens, when kept on an industrial basis, that Newcastle disease in industrial poultry farming is the most urgent problem, especially in warm climatic regions and requires effective immunoprophylaxis.

Keywords: Newcastle disease, vaccine, immunoprophylaxis, antibodies, immunoglobulin, haemagglutination, infection, contagiousness, disinfection.

Relevance of the topic. If we look at the history of poultry farming in Uzbekistan, we will see that Newcastle disease was one of the main problems.

Taking into account the fact that under conditions of industrial poultry farming a large number of birds of different ages and with different immunity are kept in a limited area, as well as due to the fact that the number of poultry in the farm is constantly changing, there is a high probability of increase in virulence of viruses during passage in birds.

Because of this, there is always a dangerous threat to the farm from the Newcastle disease pathogen. The virus that causes Newcastle disease is a pantropic infection, i.e. it has a specific development in various tissues and cells of the body.

The transmitters of Newcastle virus are domestic, synanthropic, wild and exotic birds, dogs, cats, rats, virus carriers, bird ticks, mosquitoes, ascarids, earthworms (retain the virus for 4-5 days). After infection of birds during the latent period of the disease (first 24 hours), the virus first multiplies at the site of entry, then viraemia develops, reaching a maximum level after 36 hours.

If the virus is transmitted by airborne droplets, it can be detected in the epithelial cells of the throat and trachea after 3 hours. It is then detected in the brain, lungs, trachea, spleen, kidneys, myocardium and other organs (and is stored for 2-8 days).

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In Newcastle disease transmission of the virus lasts 10-15 days, but there are reports that on industrial poultry farms, when birds of different ages are kept in one place and the number of heads is constantly changing according to the technological plan, the virus can persist for a long time. General veterinary and sanitary measures and vaccination are used to prevent Newcastle disease. Basically, strict observance of biosecurity rules - changing of workers' clothes, disinfection of transport, preparation of empty buildings to the required level, observing the principle “all empty, all filled”, not allowing synanthropic birds and dogs on the farm territory, etc.

Vaccination should be carried out according to a strictly approved schedule, taking into account the epizootic status of each farm, and both domestic and synanthropic poultry in poultry houses within a radius of 15 km from the farm - twice a year.

In the specific prevention of Newcastle disease, live and inactivated vaccines are used. Because of this, it is difficult for the immune system to fight it, and prophylactic vaccination measures according to the general instruction may not give the desired result.

Based on the above, it can be concluded that there is always a need for effective immunoprophylaxis for this disease. Newcastle disease immunoprophylactic measures are constantly implemented by specialists and introduced into production.

Despite this, the level of immunity against Newcastle disease in the blood of birds should be checked every 15 days and revaccination should be carried out. This results in an increased number of revaccinations and immune stress. Especially considering that the Newcastle disease pathogen persists as a natural source in wild birds, dangerous situations can always arise.

Moreover, in industrial poultry production, keeping broiler chickens at a rate of 10-16 birds per $1m^2$ accelerates the development of any infection and is highly likely to cause losses.

Therefore, new vaccines are being developed for immunoprophylaxis of Newcastle disease, which leads to an increase in the number of vaccinations. Vaccination of broiler chickens reared in industrial poultry farms with live vaccine of La Sota strain does not always give the desired result. In addition, it is noted that this disease is more common in countries with hot climates.

Taking into account that Uzbekistan is included in regions with hot climate and Newcastle disease is a contagious infection of high risk, the application of effective immunoprophylaxis of this disease remains one of the urgent tasks of our time.

ISSN: 2053-3578 I.F. 12.34

Object and methods of research. The research was carried out in a poultry farm designed for growing 5000 broiler chickens, located in MCC (mahalla citizens' council) 'Marifat', Samarkand city, Samarkand region.

The object of the study is broiler chickens and indicators of immunoprophylaxis against Newcastle disease established in this farm. Indicators of immune strength against Newcastle disease were determined by the method of haemagglutination inhibition reaction (HI) in the educational laboratory of the Department of 'Epizootology, Microbiology and Virology' of Samarkand State University of Veterinary Medicine, Livestock and Biotechnologies.

Results and analyses of the research. On 2 February 2021, 4200 one-day-old broiler chicks were brought to our farm. Blood serum was taken from each 25 chickens on 1, 4, 7, 14 days and immune potential against Newcastle disease was determined by haemagglutination inhibition reaction (HI) in the teaching and research laboratory of the Department of 'Epizootology, Microbiology and Virology' of the University (Table 1).

Table-1

Indices of immune strength of 1, 4, 7, 14-day-old broiler chickens against Newcastle disease

Age of chicks (day)	Number of chicks by HI titre							
	1:2	1:4	1:8	1:16	1:32	1:64	1:128	
1			3	3	2	8	8	
4			2	4	4	2	9	
7	2	3	-	5	6	5	2	
14		1	8	9	7			

As a result of the researches, it was observed that one and four day old chicks have high immunity, i.e. passive immunity. Four-day-old chicks were found to have a higher level of immunity than one-day-old chicks.

We believe this is due to the absorption of immunoglobulins from the yolk sac of the chicks into the blood during the week. From the seventh day a significant decrease in antibody titre was observed in chickens. In Uzbekistan, great attention is paid to the immunoprophylaxis of Newcastle disease and repeated vaccinations are carried out when breeding chickens are reared.

ISSN: 2053-3578 I.F. 12.34

Therefore, chickens have a high level of passive immunity. 14-day-old chickens were vaccinated in order to synchronise the immunogenic action of the vaccine antigen with the action of anti-idiotypic antigens, taking into account that the passive immune power of chickens, i.e. idiotype titre, decreased, the risk of interference disappeared and anti-idiotypes accumulated.

0.2 ml of inactivated vaccine 'Volvac ND Conc. KV' was injected under the skin of the chicks' necks and 2-valent vaccine 'AVIVAC-IB+ND' strains H-120 and La Sota was dripped into the chicks' eyes. Chickens up to 44 days of age were fed in compliance with all technological requirements, on 10-17 March 2021, 97.5% retained 36-44-day-old chicks with live weight of 2.8-3 kg were sent to slaughter. The poultry house was thoroughly mechanically cleaned and thoroughly rinsed with water, then the walls and floor were whitewashed with lime and disinfected with formalin.

On 4 April 2021, 4200 chickens were introduced into the same poultry house and the following immunoprophylactic measures were carried out (Table 2).

Table 2

Immunoprophylactic measures against infectious diseases of chicks

Age of chicks	**Name of infectious disease**	**Name of vaccines**	**Execution method**
1 day	Newcastle and Infectious Bronchitis	'AVIVAC-IB+ND' strains H-120 and La Sota	Spraying
2-6 days		Doxin (tylosin+doxycycline)	Drinking water
*** 2 times with an interval of 7 days depending on the antibody titre	Gumboro disease	'AVIVAC-IBD' strain Winterfield 2512	Drinking water
14 days	Newcastle and Infectious Bronchitis	'AVIVAC-IB+ND' strains H-120 and La Sota	Intraocular

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14 days	Newcastle	Volvac ND Conc. KV	Subcutaneous injection to the neck
24 days	Newcastle and Infectious Bronchitis	'AVIVAC-IB+ND' strains H-120 and La Sota	Drinking water

On the first day, broiler chickens were vaccinated with 2-valent vaccine 'AVIVAC-IB+ND' strains H-120 and La Sota by spraying.

Broiler chickens were prophylactically administered antibiotic Doxin (tylosin and doxycycline) for 5 days with water from two days of age.

Table-3

Indices of immune resistance of 1-day-old (before vaccination) and 14-day-old (after vaccination) broiler chickens to Newcastle disease

Age of chicks (day)	Number of chicks by HI titre							
	1:2	1:4	1:8	1:16	1:32	1:64	1:128	
1			1	4	3	7	6	
14		2	3	6	5	3	2	

The use of live La-Sota vaccine in 1-day-old chicks according to the instructions, to the vaccine is impossible, in case of its use the vaccine will be pathogenic.

However, according to researches and observations, high passive immunity, as presented in Table 3, ensures the formation of a high level of local immunity in the respiratory tract against live vaccine La-Sota virus in 1-day-old chickens. Passive immunity has a negative effect on the formation of postvaccinal immunity due to neutralisation by antibodies, i.e. interference. But powerful passive immunity is achieved through pathogenic action on the vaccine virus La Sota and the formation of active (active) immunity. Due to the pathogenic action of the La Sota vaccine, immunoglobulins of all classes (IgM, IgA) are synthesised in high concentrations in day-old chicks.

Of course, 3 days after vaccination under the influence of live La Sota vaccine, pathological changes in the upper respiratory organs were observed and mortality was higher than normal. However, prophylactic administration of the antibiotic Doxin (tylosin + doxycycline) ensured that secondary infections did not develop.

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Based on our serological researches, taking into account that the immune strength of chicks decreases after 10 days, we vaccinated them at 14 days of age.

For this purpose, 0.2 ml of La Sota inactivated vaccine 'Volvac ND Conc. KV' was injected into the neck of chicks under the skin and 2-valent vaccine 'AVIVAC-IB+ND' strains H-120 and La Sota was dripped into the eyes of chicks.

According to the results of researches, vaccination of chickens at the age of 14 years coincided with the time of decrease in passive immunity. The administration of inactivated dead Newcastle disease vaccine resulted in the formation of high-level humoral immunity. Because at this time, the immunogenic effect of the collected anti-idiotypes was synchronised with that of the vaccine.

We reared broiler chickens up to 42 days of age, they survived 98.5% and were sent to meat at a live weight of 2.85-2.95 kg.

Conclusions:

1. Formation of high local and active immunity by spraying live vaccine of La Sota strain from the first day of poultry housing is of great importance for immune defence in the subsequent rearing period.

2. Given that passive immunity begins to decline at 10 days of age, it is important to have high humoral immunity using inactivated La Sota vaccine at 14 days of age.

3 The presence of highly robust local and humoral immunity against Newcastle disease field virus is a reliable immunoprophylaxis.

4. The use of tylosin preserving antibiotics is definitely effective in controlling secondary infection after vaccination of 'AVIVAC-IB+ND' strains H-120 and La Sota to day old chickens.

5. Since Newcastle disease is a pantropic viral infection, effective immunoprophylaxis can be achieved with IgM immunoglobulins from antibodies.

6. 'AVIVAC-IB+ND' strains H-120 and La Sota vaccine should not be administered to day old chicks raised from hatching eggs imported from foreign countries or imported directly.

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