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# THE USE OF THE PHENOMENON OF IMMUNOLOGICAL RESONANCE IN IMMUNOPROPHYLAXIS OF VIRAL AND BACTERIAL INFECTIOUS DISEASES OF CHICKENS

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**Abstract:**

On the basis of the theory of idiotype-anti-idiotypic N. Erne and the results of his own research on chickens and chickens, the phenomenon of immunological resonance is described as a powerful mechanism for increasing the effectiveness of vaccines against viral diseases. A new technology has been developed for the formation of flocks in industrial poultry farming by bringing together populations of pullets of different ages. The evolutionary essence of the phenomenon of immunological resonance is highlighted. The fact is that in the evolution of birds there is a correlation between the incubation period of eggs and the transitions of the rise and fall of antitelogenesis. It is noteworthy that these synchronous fluctuations, accompanied by all the functions of idiotypes and anti-idiotypes, are provided by natural selection to change passive and active immunity against pathogens of the microbial environment.

**Keywords:** Idiotype - anti-idiotype, immunization, immunological interference, immunological resonance, population, vaccine prevention, synchronization, evolution.

## INTRODUCTION.

In recent decades, both in medicine and in veterinary medicine, the pressure of the problems of viral infections has been rapidly growing, which is especially acute in poultry farming. The fact is that the density of livestock in industrial poultry farming is incomparably high, which sharply increases the rate of spread, i.e., the passage of viruses among sensitive livestock, leading to an acceleration of the evolution of viruses towards an increase in virulence.

Currently, in the industrial poultry industry, laying hens for the production cycle, i.e. in 1.5-2 years, they are routinely vaccinated against 5-6 viruses 20-25 times, which overloads the immune system of the bird (1). In such a situation, the most pressing task of immunoprophylaxis of viral diseases of chickens will be to reduce the number of vaccinations, which is possible only by increasing the effectiveness of individual vaccinations.

Because of this, veterinary vaccinology is constantly improving vaccine preparations and the technology of their use. Despite this, the problems of viral infections continue to worsen from year to year. In recent years, in all republican and international seminars and conferences devoted to the problems of viral diseases of chickens, in which we had to participate, we are talking about the same thing that in countries with a hot climate, this is the Middle East, Mexico and we, of course, decrease in efficiency vaccination against Newcastle disease in chickens. It seems to us that this is due not only to temperature parameters, since in industrial poultry farming, the air in poultry houses is strictly conditioned, which is another factor of aridity in the habitat. Let's also start solving the cause of this problem. we have preliminary prerequisites and outlines.

A situation has developed when new mechanisms and resources of the bird's immune system that have not been used until now are required to curb the pathogenicity of viruses. The fact is that in the practice of immunoprophylaxis of Newcastle disease in chickens, we found cases of a multiple decrease in the number of vaccinations, depending on the technology of forming herds of laying hens (1). However, this required a radical breakdown of the technology of formation of flocks in the industrial poultry industry. To do this, we need to achieve universal acceptance of our strategy, which is not being done as quickly as we would like.

## MATERIALS AND METHODS.

The results of a five-year monitoring of the immunity intensity of routine vaccinations and revaccinations against the causative agent of Newcastle disease of chickens at the Agalyk-Lomanparranda JV served as the initial material for our research. Subsequent studies were and are being carried out at the Chimkurganparrandalari private poultry farm in the Ishtykhan district of the Samarkand region. Research is carried out on the Loman-brown, Loman-Sandy and Dekalb white crosses. In "Chimkurganparrandalari" there are three poultry houses for 2-2.5 thousand chickens in each.

The keeping of chickens is cellular, on an industrial basis. Schedule of routine vaccinations against viral diseases meets the modern requirements of industrial poultry farming.

The Chimkurganparrandalari poultry farm became dysfunctional due to the illness of Marek chickens. The disease is diagnosed by clinical and pathomorphological signs, since virological diagnosis of viral diseases in our conditions is unrealistic. (2).

Despite the fact that chickens at one day of age were vaccinated with the bivalent Rispens vaccine against Marek's disease, the effectiveness was insufficient. Therefore, to increase the effectiveness of the vaccine, we decided to take advantage of the phenomenon (2) of immunological resonance established by us, by synchronizing the immunogenic action of vaccine antigens and the corresponding anti-idiotypes, since the results of our studies (1) indicated the possibility of synchronization of the immunogenic action of anti-idiotypes and isolated vaccine viruses from populations of different ages. one flock of laying hens.

## RESEARCH RESULTS.

Analysis of the results of monitoring the intensity of post-vaccination immunity against Newcastle disease in chickens in 25 poultry houses of the Agalyk-Lomanparranda joint venture, where laying hens were kept from 3-4 to 18-22 months of age, 50-60 thousand heads in each showed that the frequency of vaccinations in different the poultry houses were different. In some poultry houses there were only two vaccinations for the entire production cycle, while in others it was up to seven, i.e. multiple variants differed 3.5 times. It turned out that in poultry houses where the flock was formed by pullets of different ages, the frequency of vaccinations was less than in poultry houses where the flock was formed by pullets of the same age.

It should be emphasized here that all over the world in industrial poultry farming it is required to form a flock in each poultry house only by pullets of the same age. The fact that the Agalyk-Lomanparranda JV had poultry houses with pullets of different ages is a forced violation of the technology of industrial poultry farming. It turned out to be a curiosity that it was in poultry houses, where the formation of the herd was carried out in violation of the modern requirements of industrial poultry farming, that the effectiveness of vaccinations against Newcastle disease was higher than in traditionally formed herds. The most important thing is that it was precisely in the population where the herd was formed by bringing together pullets that differ in age by exactly one month, the frequency of vaccinations was the smallest. In those herds where pullets were brought together, the frequency of vaccinations differing by less than one month is also less than in alternative ones, although not by as much as in the first case.

Biometric processing of the frequency of vaccinations in uneven-aged and same-aged flocks of 25 poultry houses showed that they differ from $1.5 \pm 0.17$ to $2.6 \pm 0.22$.

This phenomenon, in our opinion, is associated with the synchronization of the immunogenic action of the vaccine antigen and the corresponding anti-idiotypes in herds of different ages. This is confirmed by the fact that it was in the herd of different ages, for one month, that the number of vaccinations was the smallest, because the largest peak of anti-idiotypes is recorded a month after vaccinations and continues to fluctuate.

The basis for this assumption was N. Erne's theory of the idiotypic network (5). In recent decades, anti-idiotypes have been intensively studied as important immunomodulators, natural diagnoses and vaccines of the future (5). Moreover, the results of our successive studies carried out on sheep, lambs and gnotobiotic chickens and chickens also confirm that anti-idiotypes are natural vaccination preparations that ensure the formation of active immunity against pathogens of the microbial environment in all animals with collostral immunity even without even coming into contact with them. representatives.

For experimental confirmation of the role of the phenomenon, which we called immunological resonance, we are conducting research in a small private poultry farm "Chimkurgan Parrandalari". The fact is that this farm has become dysfunctional due to the illness of Marek chickens. The evidence of this is the lack of effectiveness of the conducted immunoprophylaxis. The fact is that the herd of the farm was formed by pullets vaccinated at one day of age with the latest version of the bivalent vaccine against Marek's disease, according to generally accepted requirements. However, it was necessary to find a way to improve the effectiveness of the vaccine.

According to the veterinary requirements, in farms that are dysfunctional due to Marek's disease, it is required to revaccinate pullets at 3-4 months of age before they enter the farms (4). However, our (2) and literature (3,4) data testified that transit lameness, which is the most frequently recorded symptom of Marek's disease, begins to manifest itself and can be massive from 1.5-2 months of age. Therefore, some practitioners have tried to revaccinate 7 day old chicks. However, in this case, the desired effect was not achieved.

In the experimental farm, Marek's disease manifested itself in both acute and classical forms. The greatest variant of the manifestation of this disease was the onset of transit lameness in chickens and pullets. For example, in

one herd during the production cycle, lameness was recorded in 39% of chickens, in another herd - 22% of chickens by the middle of the production cycle.

Therefore, based on the theory of N. Erne and the data we obtained on reducing the frequency of vaccinations against Newcastle disease in chickens, the revaccination was carried out in 21 and 30 day old chickens, as described above, since it is at this age that the peak accumulation of anti-idiotypes occurs in the body of chickens vaccinated daily age.

Today, at 10 months old chickens, we have 0.07% of the result of the sickness rate of the herd, that is, Marek's disease in a dysfunctional economy is practically curbed.

Despite the fact that both the literature (3) and our research data show that it is impossible to completely eradicate Marek's disease, the use of the phenomenon of immunological resonance can solve the problem of Marek's disease caused by the virus. Moreover, we believe that the use of the phenomenon of immunological resonance to the same extent contributes to ensuring the success of immunoprophylaxis and other viral diseases. Immunological resonance as a phenomenon described for the first time by us will become a powerful lever in curbing the invasion of viral infections not only in birds, but also in animals and humans, because the formation of this phenomenon is the result of natural selection among animals with a lymphoid immune system with collostral immunity.

This assumption can be confirmed by the fact that in all birds the incubation period of eggs is measured with periods measured 3,4,5,6,7, etc. multiple weeks. Likewise, the wave of antitelogenesis in all animals and birds with a lymphoid immune system also has 1, 2, 3, 4, etc. weekly periods of fluctuations in the titers of replacing antibodies of an idiotype-anti-idiotypic nature.

We believe that in the "bird colonies" on the rocks of the mountains of the North East, where billions of wild birds live in a small area, the undulating hatching of generations that differ in age measured in multiple weeks are under the powerful protection of the phenomenon of immunological resonance and collostral immunity, which ensures the avoidance of enzymes and epizootics of bacterial and viral infections. It is the theory of the idiotype-anti-idiotypic network of N. Erne that predicts that collostral immunity is capable of initiating not only passive, but also active immunity against all infectious principles of the microbial environment of animals and humans. The validity of this conclusion was confirmed in our previous studies carried out on sheep, lambs and gnotobiont chickens.

A situation has arisen when, both in medicine and in veterinary medicine in the immunoprophylaxis of infectious diseases, the concept of immunological interference, i.e. the opposition of passive immunity to the formation of active immunity is taken into account, but immunological resonance is still out of the question. We believe that where there is interference, resonance cannot exist. Consequently, if immunological interference interferes with the formation of active immunity, then immunological resonance cannot contribute, which is theoretically confirmed by N. Erne and practically described by us.

**The incidence of laying hens in a poultry farm unfavorable for Marek's disease**

| In chickens vaccinated at day old | | | In chickens vaccinated at one day and 21 days of age |
|---|---|---|---|
| For the production cycle | | By the middle of the production cycle | By the middle of the production cycle |
| N | 2200 | 2200 | 2500 |
| % incidence | 39 | 22 | 0,07 |

**Number of vaccinations against Newcastle disease in established poultry houses with populations of the same age and different age**

| Indicators | Workshop with the same age (n = 8) | Workshop with different ages (n = 11) |
|---|---|---|
| 1. Duration of immunoresistance, day M ± m | 176±33,17 | 239±91,98 |
| 2. Number of vaccinations, M ± m | 2,6±0,22 | 1,76±0,33 |

## CONCLUSIONS

1. The use of the phenomenon of immunological resonance sharply increases the success of immunoprophylaxis of viral and bacterial infectious diseases.

2. In farms, dysfunctional due to Marek's disease, the revaccination of chickens should be carried out 21-28 days after the first vaccination.

3. To use the phenomenon of immunological resonance in industrial poultry farming, it is desirable to switch to the acquisition of flocks with populations of different ages for one month.

4. In order to achieve general acceptance of our technology for the immunization of viral diseases, in the industrial poultry industry, it is necessary to conduct independent experiments on the part of other researchers.

**REFERENCES.**


1. Абдуллаев Ш.М., Мирсаидова Р.Р., «Паррандачиликда иммунзўриқиш муаммолари", Сборник материалов международная научно-практическая конференция, «Проблемы внедрения инновационных технологий в сельском хозяйстве», Самарканд-2012 год, II том, 124-126
2. Абдуллаев М.А., Мирсаидова Р.Р., «Стратегия иммунопрофилактики основанная на иммуноадаптивности кроссов и феномену иммунологического резонанса против стратегии вирусного генома болезни Марека кур»
3. журнал «Зооветеринария» № 4. Апрель 2015 г., стр 11-13
4. 3. Бакулин В.А., Болезнь Марека, в книге «Болезни птиц», с. 43-53. издатель Бакулин В.А., НПП АВИВАК, 2006г. Санкт-Петербург.
5. Коворин Р.Н. Болезнь Марека, в книге «Справочник ветеринарного врача
6. птицеводческое пердприятия», с. 90-93, Москва, Колос, 1982г.
7. Labinfo Наглядная иммунология http/www/labinfo.ru/bibl/knigi/nimm/022htm