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Epizootological Monitoring And Antigenic Activity Of The Vaccine Against Pigs Circovirus Infection.

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ABSTRACT

The second type pig swine circovirus (PCV2) circulates widely in a population of pigs from around the world with developed pig breeding and is the causative agent of the "post-detachable multisystem depletion syndrome" causing significant economic damage to industrial pig breeding. Timely diagnosis determines the strategy of reducing the economic losses associated with high morbidity and mortality of pigs of different age groups, and the algorithm to combat infection. Diagnosis of the disease is based on molecular biological and serological methods. Epizootological monitoring of circovirus infection in pig farms was carried out to identify specific antibodies to PCV2 in the serum of pigs by enzyme immunoassay (ELISA) using the BioChek diagnostic kit (Netherlands). 88 samples of blood serum of pigs of different age groups, obtained from pig-breeding complexes at various stages of the technological cycle, in which specific antibodies to type 2 circovirus were detected, indicating its circulation, were studied. A high level of antibodies was established in the serum of the repairing young animals, in the animals of the main herd, the percentage of positivity was 85%, and at 40-day-old piglets the minimum average values of the antibody level were established. With age, piglets showed an increase in the level of antibodies to swine circovirus type 2, which indicates the active stage of infection of animals after the elimination of colostral antibodies. Under experimental conditions, an evaluation of the antigenic activity of an experimental series of a whole-virus inactivated circovirus vaccine was carried out. Its high antigenic activity was established in the process of immunogenesis with a high titer of specific antibodies on day 21 after vaccination (the average titer in ELISA is 3079). The obtained data will allow to determine the algorithm for vaccination of pigs at various stages of the technological cycle and to evaluate the effectiveness of immunoprophylaxis.

Keywords: monitoring, diagnosis, enzyme immunoassay, antibodies, circovirus of the second type, vaccination.

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Detection of virus-specific antibodies in the serum of pigs by ELISA allows for large-scale diagnosis and to determine the algorithm and strategy of immunoprophylaxis. In the study of 88 serum samples obtained from pigs of different ages, in all samples revealed specific antibodies to swine circovirus type 2. A high level of antibodies was established in the serum of the repairing young animals, in the animals of the main herd, the percentage of positivity was 85%, at 40-day-old piglets the minimum average values of the antibody level were established. With age, the piglets showed an increase in the level of specific antibodies to swine circovirus type 2, which indicates the active stage of infection of animals after elimination of colostral antibodies.

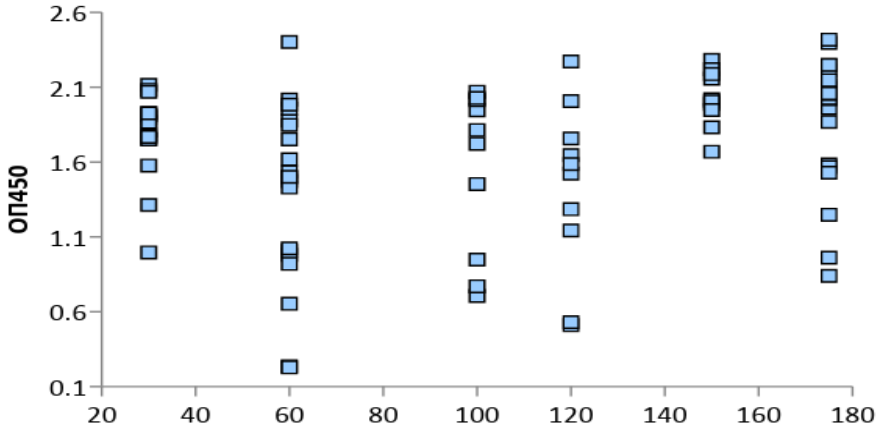

Fig. 1 - Dynamics of the level of specific antibodies to PCV2 in piglets of different ages

Thus, during the serological examination by the ELISA method for circovirus infection, the wide circulation of the virus in pigs in the examined farm is shown. When assessing the age-related dynamics of seropositivity, its increase was found as the piglets age increased, which indicates the active stage of infection of animals after the elimination of colostral antibodies.

Specific prevention of PCV2 in a number of countries with a wide circulation of circovirus has been successfully carried out by inactivated and recombinant subunit vaccines, which significantly reduce the incidence and mortality of piglets during periods of pig rearing and fattening. However, there are situations when vaccinated pigs develop a clinical manifestation of post-detachable multi-syndrome. This fact indicates, firstly, the insufficient knowledge of the mechanism of formation of immunity, and secondly, the need to develop more effective and safe means of immunoprophylaxis. In this regard, studies have been conducted in the vivarium of the Department of Molecular Biology and Virology to evaluate the antigenic activity of a new series of whole-viral inactivated PCV2 vaccine. For the experiment, 13 piglets were selected that did not have antibodies to type 2 circovirus, which were vaccinated once intramuscularly with an experimental series of vaccines according to the instructions for use. In the process of immunogenesis, all vaccinated animals showed high seroconversion to PCV2 on the 21st day after vaccination (Fig.2).

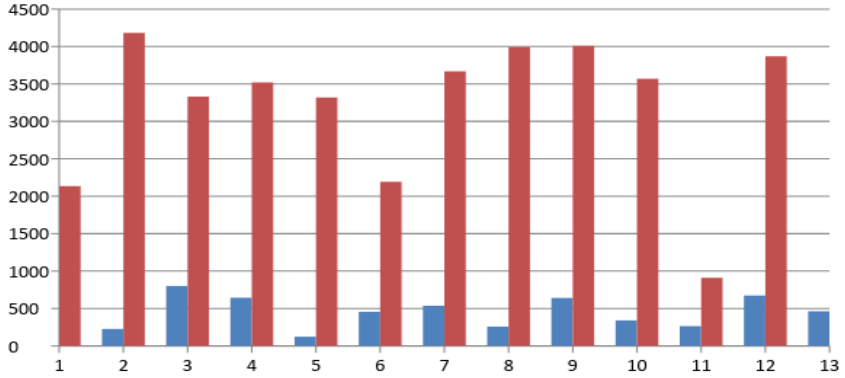

Fig. 2: Antigenic activity of a vaccine against circovirus infection of pigs (titer of specific antibodies in the serum of pigs in ELISA)

The data obtained under experimental conditions indicate a high antigenic activity of an experimental series of vaccines against circovirus infection of pigs. A regular dynamics of the growth of antibodies in post-vaccination immunogenesis with the maximum level of antibodies on day 21 after immunization was established. Considering the presence of a correlation between the level of specific antibodies and the resistance of pigs to infection with circovirus of the second type, there is reason to believe that the use of the whole virion inactivated vaccine in the system of immunization of circovirus infection is promising.

CONCLUSION

A serological study of field serum of pigs in an ELISA using the Biochek diagnostic kits, which allow detection of specific antibodies to the second type of pig circovirus, shows its wide circulation among pigs of different age groups. The trend of increasing seropositivity with increasing age of the pigs due to infection of animals against the background of a decrease in colostral immunity has been established. Under the experimental conditions, a high antigenic activity of the experimental series of the whole-virus inactivated vaccine against circovirus infection of pigs was established. Studies of the blood serum of piglets on day 21 after vaccination with an experimental series of vaccines showed that after a single immunization, high seroconversion is formed in animals (average titer in ELISA - 3079), which indicates a high antigenic activity of the tested vaccine.

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