



AVIVAC Ltd.

Modern scientific developments
and high technologies
for poultry industry





AVIVAC –

IS A GUARANTEE FOR YOUR POULTRY HEALTH



AVIVAC-ND

a vaccine against
Newcastle disease,
live, dry



AVIVAC-IB

a vaccine against
chicken infectious bronchitis,
live, dry



AVIVAC-IB+ND

a vaccine against
chicken infectious bronchitis
and Newcastle disease,
live, dry



AVIVAC-ILT

a vaccine against
infectious laryngotracheitis,
live, dry



AVIVAC-IBD-M

a vaccine against
infectious bursal disease,
live, dry



AVIVAC-IBD-BG

a vaccine against
infectious bursal disease,
live, dry



AVIVAC-REO

a vaccine against
chicken reovirus tenosynovitis,
live, dry



AVIVAC-POX

a vaccine against fowl pox,
with a diluent



AVIVAC-MAREK

a vaccine against Marek's disease,
with a diluent

diagnostic kits for detection
of infectious diseases
of birds by ELISA method



Inactivated vaccines for birds



Scientific production enterprise "AVIVAC" is a leading manufacturer of veterinary biologics for poultry industry in Russia.

The enterprise has its own scientific research basis and production capacities. Scientific departments are fitted with modern equipment which allows developing diagnostic facilities and specific prevention from infectious diseases of birds consistent with the latest scientific achievements. Productive capacities of AVIVAC Ltd. meet the requirements of GMP and provide industrial manufacturing of biologics on the basis of high world technologies. At the present time AVIVAC Ltd. produce more than 50 names of biopharmaceuticals for poultry industry, including:

- inactivated emulsive mono-, bi- and polyvalent vaccines of AVIVAC series against Newcastle disease (ND), chicken infectious bronchitis (IB), infectious bursal disease (IBD), egg drop syndrome (EDS-76), reovirus infection (REO), adenovirus with the inclusion of hepatitis with chicken hydro pericarditis, methapneumovirus infection (MPVI), respiratory mycoplasmosis (RM), along with salmonellosis, pasteurellosis and colibacillosis of birds;

- live viral vaccines against Marek's disease (MD), Newcastle disease (ND), chicken infectious bronchitis (IB), infectious bursal disease (IBD), reovirus tenosynovitis (REO), infectious laryngotracheitis (ILT), fowl pox;

- diagnostic test systems of "ELISA-AVIVAC" series on the basis of different variants of ELISA analysis: "ELISA-IB", "ELISA-ND", "ELISA-REO", "ELISA-IE" (infectious encephalomyelitis), "ELISA-ALV" (avian leukosis virus), "ELISA-AI" (avian influenza), "ELISA-MG" (respiratory mycoplasmosis), "ELISA-MS" (infectious synovitis);

- kits for laboratory diagnostics of respiratory mycoplasmosis (RM) in agglutination reaction (AR) and also egg drop syndrome (EDS-76) and Newcastle disease (ND) in hemagglutination inhibition reaction (HIR).

ELISA kit components have high sensitivity and the specificity, are stable upon storage, cost effective, so they take a lead in diagnostic and scientific laboratories at conducting serological monitoring on infectious diseases of birds.

The effective and convenient software "ELISA-AVIVAC" is developed at the enterprise for automated accounting, processing and analysis of the results of diagnostic ELISA researches. This software is compatible to various models of spectrophotometers (readers) both of domestic and foreign production.

All biological products manufactured at the enterprise are developed by specialists of AVIVAC Ltd., registered in the Russian Federation and in CIS countries and have registration certificates and conformity certificates.

Top qualification experts in the area of virology, microbiology, immunology, molecular biology and biochemistry, whose experience and high professionalism allow developing and making high quality biological preparations and provide research and scientific support to poultry farms, work in AVIVAC Ltd.



Factors influencing the quality of vaccination

Success of vaccination considerably depends on some factors which can be related to the following groups: vaccine, person and bird. The factor of a vaccine is defined by its quality value, a choice of a strain, storage of a vaccine and the vaccination program.

The human factor belongs to preparation, conducting the vaccination and monitoring of its results.

The factor of a bird is defined by immune responsiveness of an organism of a bird, and also by keeping and feeding conditions on farm.

The chosen vaccine should correspond to the production direction, epizootic situation on farm taking into account the degree of risk to which it is exposed. The way of application of the chosen vaccine should also correspond to a bird's age. Advantages and disadvantages of various vaccine strains should be taken into account while choosing.

The date of conducting of each vaccination should be exactly determined on the basis of the data of the anamnesis of the previous production parties, being grown on farm or on the basis of serological monitoring. Laboratory researches are expedient for carrying out at least once a year, for the purpose of control of change of an epizootic situation on farm.

Live and inactivated vaccines are fragile products, and quality of storage is an extremely important factor for ensuring their efficiency. Before application vaccines should be stored at temperature from +2 to +8° C, the period of storage shouldn't exceed the period established on requirements of TU.

Despite simple carrying out of technological stages of the vaccination, each wrong step can lead to efficiency loss. The equipment being used should be prepared and checked the day before vaccination. It is important not to ignore the water used at vaccination by a watering method, it should meet the requirements of microbiological control, micronutrient content (hardness of water), and also lack of disinfectants.

Vaccination itself is a stress for a bird and should be carried out with creating of optimum conditions accordingly. Moreover, it is impossible to stop vaccination after it already started. Therefore it is necessary to check beforehand the preparation of materials and the equipment, to be convinced whether there is enough quantity of a vaccine, check the staff awareness and the bird's health.



The characteristic of biological properties of live and inactivated vaccines of the AVIVAC series

Live vaccines

Live vaccines of the AVIVAC series are made on the basis of high-immunogenic production strains of viruses. Vaccines are intended for specific prevention of virus birds' diseases: Newcastle disease (ND), chicken infectious bronchitis (IB), infectious bursal disease (IBD, Gumboro disease), reovirus tenosynovitis (REO), infectious laryngotracheitis (ILT), Marek's disease (Marek 3) and fowl pox.

For the manufacturing of live vaccines of the AVIVAC series there are used only SPF-chicken embryos. Vaccines are harmless and can be applied by various group and individual methods: aerosol, ocular, intranasal, spray and watering.

At vaccinated birds the immunity providing protection of a livestock from infection with field viruses for long terms is formed.

Live vaccines are used in strict accordance with the application instruction. The program of vaccination is developed taking into account the epizootic situation on the farm, the region, the supplier of breeding production, and also a complex of diagnostic researches.



Live vaccines of AVIVAC series:

AVIVAC–ND (st. La-Sota, Bor-74, B₁)
AVIVAC–IB (st. H-120, H-52 etc.)
AVIVAC–IB+ND (st. H-120, La-Sota)
AVIVAC–IBD–BG (st. BG)
AVIVAC–IBD–M (st. Winterfield 2512)
AVIVAC–IBD–AN (st. Winterfield 2512)
AVIVAC–REO (st. S 1133)
AVIVAC–ILT (st. VNIIBP)
AVIVAC–MAREK (BGI st. FS-126)
AVIVAC–POX (st. K)

Inactivated vaccines

Inactivated mono- and polyvalent vaccines of the AVIVAC series represent the stable homogeneous emulsion which consists of one or a mix of optimally balanced virus antigens and an oil adjuvant. Vaccines are predesignated for specific prevention from infectious diseases of birds depending on antigens included into their structure. Vaccines possess the following biological properties:

- are highly immunogenic and harmless as they contain cleared and concentrated virus antigens and oil adjuvant of the best world manufacturers;
- can successfully be applied in poultry farm regardless of an epizootic situation;
- contribute formation of protective level of antibodies against each virus antigen entering into the composition of the vaccine for the term of no less than 12 months. Vaccines of the AVIVAC series can be issued in mono-, bi-, tri- and tetravalent options.

Monovalent vaccines:

"AVIVAC–IB"	"AVIVAC–ND–START"
"AVIVAC–IBD"	"AVIVAC–EDS-76"
"AVIVAC–REO"	"AVIVAC–RM"
"AVIVAC–ADENO"	"AVIVAC–Pastovac"
"AVIVAC–PNEUMO"	"AVIVAC–Salmovac"
"AVIVAC–ND"	"AVIVAC–Colivac"



Bivalent vaccines:

"AVIVAC-IB+ND"
"AVIVAC-IB+IBD"
"AVIVAC-ND+IBD"
"AVIVAC-IBD+EDS-76"
"AVIVAC-REO+EDS-76"
"AVIVAC-ND+PNEUMO"

"AVIVAC-ND+REO"
"AVIVAC-IB+EDS-76"
"AVIVAC-ND+EDS-76"
"AVIVAC-IB+REO"
"AVIVAC-IBD+REO"

Trivalent vaccines:

"AVIVAC-IB+ND+IBD"
"AVIVAC-IB+IBD+REO"
"AVIVAC-ND+EDS-76"
"AVIVAC-IBD+EDS-76"
"AVIVAC-REO+EDS-76"

"AVIVAC-IB+ND+EDS-76"
"AVIVAC-ND+IBD+REO"
"AVIVAC-IB+IBD+EDS-76"
"AVIVAC-ND+REO+EDS-76"
"AVIVAC-IB+ND+REO"

Tetravalent vaccines:

"AVIVAC-IB+ND+IBD+EDS-76"
"AVIVAC-IB+ND+REO+EDS-76"

"AVIVAC-IB+IBD+REO+EDS-76"
"AVIVAC-IB+ND+IBD+REO"

The use of polyvalent vaccines allows reducing labor costs during the usage and costing value of poultry production.





AVIVAC-ND

a vaccine against Newcastle disease,
live, dry



General provisions

Live dry vaccine against Newcastle disease (ND) is prepared from La-Sota, Bor-74 VGNIK or B₁ strains of ND virus. The vaccine is a homogenous dry porous substance, of pale yellow or pale brown color, that easily dissolves in water or physiological solution without forming of flakes and dreg. The vaccine is available in 1 to 5 cm³ vials (ampoules). Each vial (ampoule) contains 100–5000 doses.

Biological properties

One commercial dose of the vaccine corresponds to one nasal dose, being 6,7 lg EID₅₀ of ND virus (La-Sota and B₁ strains) or 6,0 lg EID₅₀ (Bor-74 VGNIK strain). The immunity of vaccinated chickens is forming during 2–3 weeks and keeps up to 3 months. The vaccine with biological activity no less than 8,5 lg EID₅₀ is applicable for use. The vaccine causes no clinically evident reaction or post-vaccination complication of chickens. The vaccine possesses no therapeutic properties.

Indication for use

Clinically healthy birds of all ages are vaccinated orally, intranasally, (intraocularly except the vaccine prepared from B₁ strain), by coarse spray or by aerosol. Time of vaccination is determined in accordance with antibody level estimated by hemagglutination inhibition test examining 25 blood serum samples collected from birds in each poultry house with 4 HAU of ND virus by general method.

Chickens should first undergo serological testing at the age of 5 to 10 days. Birds should be vaccinated if hemagglutinin titers are lower than 1:8 in 20% or more of the samples. If hemagglutinin titers are higher than 1:8 in 80% or more of the samples, the birds should be tested every 3–5 days. If the intensity of immunity is lower than 80% (i.e. if hemagglutinin titers are lower than 1:8 in 20% or more of the samples), the birds should be revaccinated.

Further serological testing should be carried out at intervals of 14 to 28 days. In ND-free farm units it would be reasonable to vaccinate birds at the age of 15–20 days, 40–45 days and so forth depending on the intensity of immunity. In ND-affected farm units birds should be vaccinated in accordance with the intensity of immunity.

Revaccination is carried out if antibody levels in blood serum obtained from vaccinated birds and determined by hemagglutination inhibition test are less than 4 log₂ (1:8–16) in 20% of the samples.



Intranasal (intraocular) method (for strain La-Sota and Bor-74)

The vaccine is diluted with water or physiological solution so that one immunizing dose is contained in 0,1 cm³ (2 drops) of preparation. The prepared vaccine is rinsed with the eye pipette into a nostril of each chicken in volume of 0,1 cm³ (2 drops), the other nostril is closed with a finger in order to reach deeper penetration of a preparation into a nasal cavity. In case of obstruction of a nasal crack a vaccine in the same volume is put on an eye conjunctiva.

An oral method (with drinking water)

The day before the application of a vaccine the volume of the water drunk in 1–1,5 hours period by a party of chickens subject to immunization is defined.

At conducting of the vaccination the demanded quantity of doses of the vaccine, corresponding to number of chickens of vaccinated party (at the rate of 10 nasal doses on a quantity of water, drunk by one chicken), is diluted in the established volume of water and spilled to the drinking bowl which was washed without disinfectants. For a watering method the boiled water by temperature not above +20° C is used. For the virus stabilization it is reasonable to add 5% (on weight) of dry skim milk or 20% (from the volume) of skim milk into water. Before the vaccination a bird is kept without water within 2–3 hours. Feeding and watering of birds is permitted after 2 hours after conducting of the vaccination.

A method of coarse dispersion (spray)

Flask content is diluted in cold pure water, free from chlorine and iron ions, at the *rate of 1 nasal dose per 1 head*. Work solution of a vaccine is prepared directly before the application.

Spray device should be pure, without corrosion of metal and the remains of a disinfectant. It is possible to use the device for coarse dispersion such as "Avtomax", backpack or similar which is previously regulated in the way that diameter of drops is 0,1–0,4 mm. The vaccine dissolved with water should be sprayed over the corresponding quantity of birds from distance of 30–40 cm, preferably when birds sit together at low light.

The humidified plumage of birds is regarded as a control of correctly carried out vaccination. For daily chickens there is used 0,25 l of water on 1000 birds a nozzle that is forming drizzle is applied. For more adult bird a vaccine is diluted at the rate of 1000 doses in 1 liter of water and a nozzle forming large drops is used.

Aerosol method of vaccination

At an aerosol method of immunization work, dilution of a preparation is determined by a formula:

W.D. = (C x V x T x A) / D, where:

W.D. – work dilution of a virus;

C – concentration of an aerosol of a virus (mg/l) indoors, which quantity amounts to:

0,1 – in insufficiently pressurized hen houses (cracks in windows and doors, small draft through positive pressure ventilation);



0,2 – in well pressurized rooms (carefully adjusted windows, doors, hatches of ventilating mines, lack of cracks). In badly pressurized hen houses aerosol carrying out the vaccination is forbidden.

V – pulmonary volume of birds which is counted by a formula:

V = 0,78 x m – 16/1000, where

V – pulmonary volume, l/minute;

0,78 cm³/minutes, g – volume of the breath falling on 1 g of weight of a bird;

m – average weight of a bird;

16 – constant factor.

Average weight is determined by weighing of 30 birds taken from various places of a bird house.

T – exposure time of an aerosol on birds which shouldn't exceed 20 minutes.

The exposition of immunization is measured after 1–3 minutes since the beginning of operation of generators of an aerosol. In hot days immunization of birds is carried out early in the morning hours and exposition time reduces till 15 minutes.

A – biological activity of a vaccinal virus (lg EID₅₀ cm³) which should be defined previously before carrying out the immunization and is measured in lg EID₅₀ mg.

D – the immunizing dose of a virus which should be 600 EID₅₀ for 31 day old chickens, and for birds of a 1 month age or more – 1000–1200 EID₅₀.

Example: biological activity of a virus is 9,0 lg EID₅₀ cm³ or 6,0 lg EID₅₀ mg (1.000.000 EID₅₀/mg). Concentration of an aerosol of a virus in hen house is 0,1 mg/l. The exposition of immunization lasts for 20 minutes. The pulmonary volume of a bird equals 0,2 l/minute. A dose of a vaccinal virus which chickens should receive is 1000 EID₅₀.

W.D. = (CVTA) / D = (0,1 x 0,2 x 20 x 1000000) / 1000 = 400, i.e. 1 cm³ of a vaccinal virus is necessary to dissolve at the rate of 1:400. Total amount of a lyophilized virus, which is necessary to take for preparation of work dilution in particular hen house, is defined on the base of the volume of hen house (m³) and work dilution of a virus.

Example: the volume of hen house is 5000 m³, work dilution of a virus is 1:400. The rate of work dilution of a virus is 1 cm³ on 1 m³ of a hen house. Thus, for this hen house 5250 cm³ of work dilution of a virus is required (5000+5% for the remains in aerosol generator). The quantity of a lyophilized virus is 13,1 cm³ (5250:400) for this hen house.

For preparation of work dilution there is taken a vaccine from no less than three flasks (ampoules), taken from different boxes (even if by calculation one bottle is required); but only that quantity of a vaccine which is necessary for dispersion in hen house of certain volume is used.

A vaccine virus is dissolved in pure distilled or boiled water, cooled to room temperature, in water with one of the following stabilizers: 5% (on weight) of dry skim milk, 10% (on volume) of chemically pure glycerin, 25% (on volume) of the pasteurized skim milk.



Aerosol vaccination is carried out by means of aerosol generators, which are filled in with necessary quantity of a vaccine.

Placement of generators and an operating mode are determined according to operation manual. Before connection of the aerosol generators to a source of the compressed air, bruders are lifted, windows are closed, doors and ventilating hatches are closed, hoses are blown, supply and exhaust ventilation is switched off.

Time from the moment of switching off of forced and exhausts ventilation before the beginning of operation of generators shouldn't exceed 5 minutes. After vaccination aerosol generators are switched off, hen houses are aired (hatches of ventilating systems are opened, and also windows and doors in a warm season, and forced-air and exhaust ventilation is switched on). It is permitted to enter into hen house not earlier than 10 minutes after the beginning of ventilation.

Aerosol vaccination is carried out under the veterinarian control, operating this method. The persons participating in carrying out aerosol vaccination should be dressed in dressing gowns, caps, boots, have goggles, respirators or gas masks.

On the 3rd–5th day after aerosol vaccination 5–10% of the imparted livestock of chickens can show insignificant oppression, apnoea, decrease in the appetite, death loss can occur. These effects will disappear in 10–12 days after vaccination. Adult birds as a rule do not have postvaccination reactions.

The intensity of postvaccinal immunity is defined in 14–21 days after vaccination in HIR or in ELISA with use of diagnostic kits, registered in Russian Federation. Vaccination is considered to be successful if no less than 80% of the imparted chickens antibodies titer to a virus ND in HIR will be not lower than 1:16 (4,0 log₂) or in ELISA will exceed twice and more the minimum positive indicator stipulated in manual on application of a definite diagnosticum. Existence of antibodies below this level in blood serum of birds forms the basis for carrying out a revaccination.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date if kept and transported in a dark dry place at a temperature between +2 and +10° C.



AVIVAC-IB

a vaccine against chicken infectious bronchitis,
live, dry



General provision

Live dry vaccine against chicken infectious bronchitis (IB) is prepared from Massachusetts serotype strain of IB virus (H-120, H-52 etc.) and represents itself a homogenous dry porous substance, of pale yellow or pale brown color, that easily dissolves in water or physiological solution without forming of flakes. The vaccine is available in of sealed vials (ampoules) in the volume of 1 to 5 cm³. Each vial (ampoule) contains 100–5000 doses.

Biological properties

One commercial dose of the vaccine corresponds to one nasal dose, being 3,5 lg. The immunity of vaccinated chickens is forming during 2–3 weeks after the second vaccination and keeps up to 3 months. The vaccine with biological activity no less than 6,0 lg EID/TCD₅₀/cm³ is applicable for use.

The vaccine is innocuous, areactogenic, possesses no therapeutic properties.

Indication for use

Clinically healthy birds of all ages are subject to vaccination depending on the epizootic situation of IB. Birds are vaccinated twice at an interval of 10 to 14 days orally, intranasally, intraocularly or via coarse spray.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date if kept and transported in a dark dry place at a temperature between +2 and +10° C.



AVIVAC-IB+ND

a vaccine against chicken infectious bronchitis and Newcastle disease, live, dry

General provision

Vaccine against infectious bronchitis (IB) and Newcastle disease (ND) is prepared from extraembryonic liquid of SPF chicken embryos infected by attenuated viruses of chicken infectious bronchitis (IB), Massachusetts serotype strain of IB virus (H-120, H-52 etc.) and Newcastle disease (ND strain La-Sota, Bor-74 VGNKI, B₁). The vaccine represents itself a homogenous dry porous substance of pale yellow or pale brown color that easily dissolves in water without forming of flakes of dreg.

One immunizing dose of the vaccine contains 3,5 lg EID₅₀ of IB virus and 6,5 lg EID₅₀ of ND virus; 6,0 lg EID₅₀ of ND virus of strain Bor-74 VGNKI; from strains La-Sota and B₁ – 6,7 lg EID₅₀.

The vaccine is available in quantity of 100–5000 doses in glass vials (ampoules).

Biological properties

The immunity of vaccinated chickens is forming during 2–3 weeks after the second vaccination and keeps up to 3 months. The vaccine with biological activity no less than 6,0 lg EID/TCD₅₀/cm³ for IB component and 8,5 lg EID₅₀/cm³ for ND component is applicable for use.

The vaccine is innocuous, areactogenic, possesses no therapeutic properties.

Indication for use

The vaccine is applied for prevention of chicken infectious bronchitis and Newcastle disease.

Clinically healthy birds of all ages are subject to vaccination depending on the epizootic situation of IB and ND. Birds are vaccinated twice at an interval of 10 to 14 days orally, intranasally, intraocularly or via coarse spray.

The intensity of postvaccinal immunity is defined in 2–3 weeks after the second vaccination in HIR or in ELISA with use of diagnostic kits, registered in Russian Federation. Vaccination is considered to be successful if no less than 80% of the imparted chickens' average antibodies titer to viruses IB and ND in HIR will exceed twice and more the minimum positive indicator stipulated in manual on application of a definite diagnostic. The antibodies titer to ND virus in HIR should be no less than 1:16 (4,0 log₂).



Existence of antibodies below this level in blood serum of birds forms the basis for carrying out a revaccination. Existence of antibodies below this level in blood serum of birds forms the basis for carrying out a revaccination.

There are no limits for use of meat and eggs from the vaccinated birds.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date if kept and transported in a dark dry place at a temperature between +2 and +10° C.





AVIVAC-IBD-BG

a vaccine against chicken infectious bursal disease,
live, dry

General provision

Vaccine "AVIVAC-IBD-BG" is prepared from virus-containing substrate (culture of cells of different origin or extraembryonic liquid, homogenate of carcasses and chorioallantoic membranes of SPF chicken embryos infected with strain of BG of infectious bursal disease virus.

The vaccine is of pink-brown homogenous dry porous substance that easily dissolves in water without forming of flakes of dreg.

The vaccine is available in quantity of 100–5000 doses in glass vials (ampoules). One immunizing dose of the vaccine contains 3,5 lg EID₅₀.

Biological properties

There are specific antibodies to IBD virus which are formed by a vaccine the chickens are ingrafted with. The immunity of vaccinated chickens is forming during 2–3 weeks after the double vaccination and keeps up to 6 months.

The vaccine does not cause significant side effects and in recommended doses is innocuous, areactogenic, possesses no therapeutic properties.

Indication for use

Only clinically healthy birds of all ages are subject to vaccination. Chickens of 7–21 day age are vaccinated by a watering method with the interval 10–14 days. The date of the first vaccination is defined by the level of passive (maternal) antibodies in the blood serum of the chickens subject to vaccination, in serological reactions (ELISA, PH, DPR etc.).

Vaccination procedure

The day before the application of a vaccine the volume of the water drunk in 1–1,5 hours period by a party of chickens subject to immunization per 1 head is defined.

At conducting of the vaccination the demanded quantity of doses of the vaccine, corresponding to number of chickens of vaccinated party is diluted in the established volume of water and spilled to the drinking bowl which was washed without disinfectants. For a watering method the clean boiled water cooled to room temperature is used. For the virus stabilization it is reasonable to add 5% (on weight) of dry skim milk into water. Before the



vaccination a bird is kept without water within 2–3 hours. Feeding and watering of birds is permitted after 2 hours after conducting of the vaccination.

The intensity of postvaccinal immunity to IBD is defined in 21 days after the vaccination in serological reactions (PH, DPR) or in ELISA with use of diagnostic kits, registered in Russian Federation. Vaccination is considered to be successful if no less than 80% of the imparted chickens' average antibodies titer in blood serum will exceed twice and more the minimum positive indicator stipulated in manual on application of a definite diagnosticum. Existence of antibodies titers below this level in blood serum of birds forms the basis for carrying out a revaccination.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date. It is forbidden to use it after the exposure date. The vaccine is kept in a dark dry place at a temperature between +2 and +10° C.





AVIVAC-IBD-M

a vaccine against chicken infectious bursal disease,
live, dry

General provision

"AVIVAC-IBD-M" is prepared from virus-containing substrates (cell cultures of different origin, extraembryonic liquid, carcasses and chorioallantois membranes of SPF chicken embryos) infected with one strain of Gumboro disease virus Winterfield 2512 of high level attenuation. The vaccine represents a dry homogenous porous brown substance that easily dissolves in water without formation of flakes and dreg.

The vaccine is available in quantity of 100–5000 doses in glass flasks (ampoules). One immunizing dose of the vaccine contains 3,5 lg EID₅₀.

Biological properties

There are specific antibodies to IBD virus which are formed by a vaccine the chickens are ingrafted with. The immunity of vaccinated chickens is forming during 2–3 weeks after the double vaccination with the interval of 10–14 days and keeps up to 6 months.

The vaccine does not cause significant side effects and in recommended doses is innoxious, areactogenic, possesses no therapeutic properties.

Indication for use

Only clinically healthy birds should be subject to vaccination. The vaccine is administered into drinking water to 7–15-day-old chickens twice at an interval of 10–14 days. Time of vaccination is determined according to the level of passive (i.e. mother's) antibodies (ELISA, PH, DPR etc.).

The intensity of postvaccinal immunity to IBD is defined in 21 days after the vaccination in serological reactions (PH, DPR) or in ELISA with the use of diagnostic kits, registered in Russian Federation. Vaccination is considered to be successful if no less than 80% of the imparted chickens' average antibodies titer to will exceed twice and more the minimum positive indicator stipulated in manual on application of a definite diagnosticum. Existence of antibodies titers below this level in blood serum of birds forms the basis for carrying out a revaccination.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date. It is forbidden to use it after the exposure date. The vaccine is kept in a dark dry place at a temperature between +2 and +10° C.



AVIVAC-IBD-AN

a vaccine against chicken infectious bursal disease,
live, dry



General provision

"AVIVAC-IBD-AN" is prepared from virus-containing substrates (cell cultures of different origin, extraembryonic liquid, carcasses and chorioallantois membranes of SPF chicken embryos) infected with strain of Gumboro disease virus Winterfield 2512 of low level attenuation. The vaccine represents a dry homogenous porous substance of brown and pink color that easily dissolves in water without formation of flakes and dreg.

The vaccine is available 100–5000 doses in glass flasks (ampoules). One immunizing dose of the vaccine contains 3,0 lg EID₅₀.

Biological properties

There are specific antibodies to IBD virus which are formed by a vaccine the chickens are ingrafted with. The immunity of vaccinated chickens is forming during 2–3 weeks after the double vaccination with the interval of 10–14 days and keeps up to 6 months.

The vaccine does not cause significant side effects and in recommended doses is innoxious, areactogenic, possesses no therapeutic properties.

Indication for use

Only clinically healthy birds should be subject to vaccination. The vaccine is administered by watering to 7–15-day-old chickens twice at an interval of 10–14 days. Time of vaccination is determined based on the level of passive (i.e. mother's) antibodies (ELISA, PH, DPR etc.).

The intensity of postvaccinal immunity to IBD is defined in 21 days after the vaccination in serological reactions (PH, DPR) or in ELISA with the use of diagnostic kits, registered in Russian Federation. Vaccination is considered to be successful if no less than 80% of the imparted chickens' average antibodies titer will exceed twice and more the minimum positive indicator stipulated in manual on application of a definite diagnosticum. Existence of antibodies titers below this level in blood serum of birds forms the basis for carrying out a revaccination.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date. It is forbidden to use it after the exposure date. The vaccine is kept in a dark dry place at a temperature between +2 and +10° C.



AVIVAC-REO

a vaccine against chicken reovirus tenosynovitis,
live, dry

General provision

The "AVIVAC-REO" vaccine is prepared from attenuated strain S 1133 of birds' reovirus, which is cultivated on the cells of fibroblast of SPF chicken embryos with addition of a stabilizer. The vaccine represents a homogenous porous substance of yellowish brown or pink color that easily dissolves in water or physiological solution without formation of flakes or dreg.

The vaccine is prepacked in vials (ampoules) by the volume of 2–10 cm³.

Biological properties

The immunity of vaccinated chickens is forming during 2–3 weeks after the double vaccination and keeps up to 10–12 weeks. For creation of a life-long immunity it is reasonable to carry out the revaccination of a bird at the age of 100–110 days with the inactivated vaccine against reovirus tenosynovitis according to the usage instruction.

The vaccine with the biological activity no less than 10^6 TCD₅₀/cm³ is used. One immunizing dose contains no less than 10^4 TCD₅₀/cm³.

The vaccine does not cause significant side effects and in recommended doses is innocuous, areactogenic, possesses no therapeutic properties.

Indications for use

The vaccine is used for prophylactic immunization of birds in farm units threatened or affected by reovirus tenosynovitis. Only clinically healthy birds should be subject to vaccination. Birds should be vaccinated twice, at the age of 7–10 days and 35–40 days. The vaccine is administered percutaneously.

Percutaneous method

Before use the vaccine is diluted with sterile physiological solution at a rate of 10^4 TCD₅₀/cm³ per 0,2 cm³ of solution. The vaccine is administered percutaneously in the lower third of the neck. The site of injection should be disinfected with 70% ethanol. The vial with the diluted vaccine should be shaken intermittently.

Intensity of the immunity is tested 21 days after vaccination. Blood serum samples from 20 to 25 are tested by ELISA in accordance with standard practice. Vaccination is considered to be successful if, in 80% or more of the blood serum samples collected from vaccinated



birds, the average avian reovirus antibody titre will exceed twice and more the minimum positive indicator stipulated in manual on application of a definite diagnosticum.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date. It is forbidden to use it after the exposure date. The vaccine is kept in a dark dry place at a temperature between +2 and +8° C.





AVIVAC-ILT

a vaccine against birds' infectious laryngotracheitis,
live, dry

General provision

The "AVIVAC-ILT" vaccine is made for specific prevention of birds' infectious laryngotracheitis. It is prepared from extraembryonic liquid, carcasses and chorioallantois membranes of SPF chicken embryos infected with attenuated strain of birds' infectious laryngotracheitis (strain VNIIBP). The vaccine represents a homogenous porous substance of yellowish brown or pink color that easily dissolves in water or physiological solution without formation of flakes or dreg.

The vaccine is available in the volume of 1 to 5 cm³ of sealed vials (ampoules). One immunizing dose of the vaccine contains 10³ lg EID₅₀ of attenuated ILT virus.

Biological properties

There are specific antibodies to ILT virus which are formed by a vaccine the chickens are ingrafted with. The immunity of vaccinated chickens is forming during 2–3 weeks after the double vaccination and keeps up to 6–12 months.

The vaccine does not cause significant side effects and in recommended doses is innocuous, areactogenic, possesses no therapeutic properties.

Indications for use

The vaccine is used for prophylactic immunization of birds in farm units threatened or affected by ILT. Only clinically healthy birds should be subject to vaccination. Birds should be vaccinated twice, first time beginning from 25-day age, second vaccination is held at the intraocular and enteral method after 20–30 days; at the aerosol vaccination – after 16–20 days, at the cloacal vaccination – after 30 days. At the aerosol method of vaccination afterwards the bird is revaccinated with the 6 months interval.

The existence of emerging infection diseases in particular proceeding with the respiratory syndrome is a contraindication for carrying out a vaccination against ILT by aerosol method.

Watering (enteral method)

For immunization there is used a vaccine with the biological activity no less than 5,2 lg EID₅₀/cm³. The day before the application of a vaccine the volume of the water drunk in 1 hour period by 1 chicken is defined. The next day the vaccine is diluted in a way that in the earlier defined definite volume per 1 head there is 1 enteral dose of a vaccine which equals



4 ocular doses. To define the quantity of enteral doses containing in 1 flask (ampoule) it is necessary to divide the quantity of ocular doses by 4. For example, there are 2000 ocular doses in a flask, so the quantity of enteral doses is 500 ($2000:4 = 500$). The content of flasks with the vaccine is diluted in pure boiled water, cooled to room temperature. For the virus stabilization it is reasonable to dissolve skim milk in the water by rate 2.5 g on 1 l of the work solution. Drinking bowls in which there is poured the diluted vaccine should be thoroughly washed without disinfectants. Before the vaccination a bird is kept without water within 1.5–2 hours. In hot weather the time is reduced and vaccine is watered during 1 hour.

Intraocular method

For immunization there is used a vaccine with the biological activity no less than $5,2 \lg \text{EID}_{50}/\text{cm}^3$. To define the quantity of a dissolvent a quantity of cloacal doses containing in one vial (ampoule) is necessary to multiply by the volume of one immunizing dose of the dissolved vaccine which is 0.05 cm^3 . The vaccination is carried out with an eye pipette rinsing 1 drop on the eye conjunctiva of a bird (it is preferable to rinse 1 eye, right or left to all the livestock).

Aerosol method

For immunization there is used a vaccine with the biological activity no less than $5,2 \lg \text{EID}_{50}/\text{cm}^3$. Work dilution of a vaccine is prepared, proceeding from biological activity of an immunizing dose which is $2,5\text{--}3,0 \text{ EID}_{50}$ for the first vaccination and for the second and the subsequent – $7,5 \text{ EID}_{50}$ 20 minutes since the beginning of operation of aerosol generators (exposition of immunization is counted after 1–3 minutes from the beginning of operation of aerosol generators. In hot days immunization of birds is carried out at early morning hours and an exposition is shortened till 15 minutes); volume of breath of birds in the $\text{dm}^3/\text{minutes}$, defined by multiplication of average mass of birds (g) on a constant value of $0,78 \text{ cm}^3/\text{minutes}$ and the subsequent subtraction from the received product of the value that equals 16. Average mass of birds is defined by weighing of 10 chickens taken from three various places of hen house. The expenditure of the work dilution of a vaccine are $1 \text{ cm}^3/\text{dm}^3$ of volume of a room.

Work dilution of a vaccine is prepared on the distilled water with addition of 0,25% (on weight) dry skim milk or 0,5% (on volume) chemically pure glycerin. Vaccine is sprayed by means of aerosol generators "SAG-1". Generators are filled with work dilution of a vaccine at the rate of no more than 250 cm^3 on a glass. Generators are placed in hen house in chessboard order, at height of 120–130 cm from the floor at the rate of one generator on 150 m^2 of the floor at hen house height up to 4 m. Before the beginning of dispersion it is necessary to close windows, doors, ventilating hatches and switch off positive pressure ventilation. After switching off the ventilation the compressed air under the pressure of 3.5–4.0 atm. is supplied on generators. After the completion of vaccination hen houses are ventilated.



Cloacal method

For immunization there is used a vaccine with the biological activity no less than $5,2 \text{ Ig EID}_{50}/\text{cm}^3$. To prepare work dilution the quantity of boiled and cooled water of physiological dissolvent in which it is necessary to dissolve the contents of a flask is defined. For this purpose quantity of doses containing in one vial (ampoule) is necessary to multiply by the volume of one immunizing dose of the dissolved vaccine which is $0,02 \text{ cm}^3$.

Before the vaccination the bird is kept without feeding during 10–12 hours. The diluted vaccine is rubbed in the mucus membrane of upper fornix of cloaca with the glass ribbed eye spreader. The veterinarian puts the spreader into the flask with the vaccine and applies it to the opened mucus membrane of a cloaca with 5–6-fold movement of a spreader with the slight pressing. In case of excrements occurring in the moment of infraction the bird is vaccinated additionally. One spreader is used only for one bird. Spreaders before the vaccination and after use are sterilized and boiled during 30 minutes. The diluted vaccine is used only during 1 hour after preparation. On the 5th–6th day after vaccination the quality of the vaccine is checked by the occurring of water retention and hyperemia of a mucus membrane of 100 chickens. If the reaction on a vaccine occurs at 80 chickens, the immunization is repeated with the use of a new series of vaccine and the reason for inefficiency of the preparation used for the previous inoculation is defined.

Precautinary meaures

All the people participating in vaccination of birds should be dressed in special clothes (gumboots, dressing gowns, trousers, headgear, rubber gloves) and be provided with individual means of protection: closed type goggles, respirators or gas masks. During vaccination water and food reception, smoking is forbidden. Participation in carrying out vaccination, especially aerosol method, is not allowed persons with signs of respiratory, gastroenteric, skin and allergic diseases.

In case of vaccine hits the open sites of skin of hands, this area is alcoholized with 70% alcohol solution. In case of pouring of the vaccine, the infected area of a floor or the soil is filled with 5% solution of chloramine or caustic sodium. The remains of a vaccine are neutralized by mixing in the ratio 1:1 from 5% solution of chloramine or caustic sodium.

Storage conditions

The shelf life of the vaccine is 12 months from the manufacturing date. It is forbidden to use it after the exposure date. The vaccine is kept in a dark dry place at a temperature between $+2$ and $+8^\circ \text{C}$.



AVIVAC-POX

a vaccine against birds' pox, live, dry, with a diluent



General provision

The vaccine is made for specific prevention from birds' pox. It is prepared from virus-containing material (culture of skin cells of SPF chicken embryos infected by attenuated strain K of the chicken pox virus). The vaccine represents a homogenous porous substance of yellow-white or pink-white color that easily dissolves in inclosed diluent without formation of flakes or dreg.

One immunizing dose of the vaccine is 1000 ID₅₀ of the chicken pox virus. The diluent represents itself a 25% dissolvent of glycerin in phosphate buffer solution. It is a transparent colorless liquid.

The vaccine is available in glass vials (ampoules) of 100–500, 1000 ID₅₀ immunizing doses. The diluent is available in glass flask at the rate of dilution of 350–1400 doses of vaccine.

Biological properties

The vaccine causes forming of the immunity to the chicken pox due to the factors of cellular and humoral immunity during 5–7 days after the immunization. Bird that was vaccinated at the age of 2 months or more keeps the immunity during all period of growth.

The vaccine is innoxious, areactogenic, possesses no therapeutic properties.

Indications for use

The vaccine is used for prophylactic immunization of birds in farm units threatened or affected by pox. Only clinically healthy birds of 2 month age or more should be subject to vaccination. Birds should be vaccinated once. In the case of necessity of the immunization in earlier terms the vaccination is carried out at the age of 25–30 days and then revaccinated once after 2–3 months.

At the outbreak of other emerging infection diseases the vaccination against pox is forbidden.

Before use, the vaccine should be dissolved with diluent. For this purpose the contents of flasks with vaccine is dissolved in one flask of diluent in accordance with the table below:



Quantity of doses in one flask	Quantity of flasks with vaccine dissolving in diluent in the volume:	
	10 ml	20 ml
100	7	14
200	4	7
300	3	5
400	2	4
500	2	3

The vaccine is administered intradermally by the injection method to the wing web with 2-needle injector; the volume of the dose is 0.013–0.015 cm³.

The reaction on a vaccine occurs on 5–8 day after the immunization and is characterized by the formation of pock pits on the inner and outer surface of the wing web of birds in the place of the injection. The pock pits disappear after 28–30 days.

The slaughter and the offtake of poultry meat is permitted in 14 days after vaccination without limits.

Storage conditions

The shelf life of the vaccine and diluent is 12 months from the manufacturing date on the condition that the vaccine is kept and transported at a temperature between +2 and +10° C and the diluent at a temperature between +2 and +25° C.





AVIVAC-MAREK

a vaccine against Marek's disease, live, dry



General provision

The vaccine against Marek's disease "AVIVAC-MAREK" is prepared from different production virus strains: attenuated strains of Marek's disease virus (MDV), non-virulent strains of chicken herpes virus (CHV) and avirulent strains of herpes virus of turkeys (THV). Mono-, bi- and polyvalent forms of the vaccine are produced. The vaccine is available in either liquid or lyophilized form:

- Serotype 3 HVT "AVIVAC-MAREK-3", liquid;
- Serotype 3 HVT "AVIVAC-MAREK-3", lyophilized;
- Serotype 1 MDV + 3 serotype MDV "AVIVAC-MAREK-1+3", liquid;
- Serotype 1 MDV + serotype 2 MDV + serotype 3 MDV – "AVIVAC-MAREK-1+2+3", liquid.

The liquid vaccine is a frozen homogenous substance with a horizontal meniscus or a homogenous yellowish pink substance upon melting. The dry vaccine is a yellowish white homogenous porous substance.

The liquid vaccine is produced with the special diluent "AVIVAC-MAREK" which is a transparent colorless 2% buffer solution containing polyethylene glycol and an immunomodulator.

For a lyophilized (dry) vaccine from VGI – "AVIVAC-MAREK" there is used a diluent "A diluent of a virus vaccine against Marek's disease cultural dry of THV FS-126" TU 9384-010-00482915-01. A liquid vaccine is packaged in ampoules of 1.0–3.0 cm³, dry – in bottles on 1–2 cm³.

Ampoules with the frozen liquid vaccine are packed into cardboard boxes, metal supports (holders) or gauze sacks with weight and are placed in vessels of the Dewar with liquid nitrogen at temperature –196° C. Flasks with a dry vaccine on 10–100 pieces in each are packed into cardboard or polyethylene boxes with existence of nests or the partitions providing their immovability and integrity.

Biological properties of a vaccine

Immunity of the imparted chickens is formed within 2 weeks after vaccination and remains for life. At observance of rules of transportation, storage and application of preparation,



and also veterinary and sanitary and zootechnical standards of the keeping and feeding of birds, the vaccine provides protection of a livestock minding virus of an Marek's disease no less than for 90%. The vaccine doesn't cause clinically expressed reaction of chickens and postvaccinal complications. The vaccine possesses no therapeutic properties.

Indication for use

The vaccine is used for preventive immunization of chickens in farm units affected by Marek's disease. Chickens should be vaccinated during the first hours after hatching, singly, in the hatching house or other special premise. If the necessary equipment is of the "Ovojack" type available, it is recommended to administer the vaccine on the 18th day of incubation directly in the embryo.

Ampoules with a liquid vaccine are carefully taken from a vessel of the Dewar just before application in the quantity necessary for work within 30 minutes, and are quickly defrosted, immersing them in water with temperature +27° C. Hands, face and eyes of the person at the moment of extraction of ampoules from nitrogen should be protected from possible hit of glass in case of ampoule explosion.

Vials with the diluent should be incubated at a temperature between +20 and +22° C for 8 to 12 hours before use.

Ampoules with a vaccine are opened right after defrosting, and their contents are carried by means of a syringe in beforehand defined quantity of bottles with a diluent. Then each ampoule is rinsed with a diluent by 2–3 times which is also transferred to bottles with the dissolved vaccine.

1 ampoule containing 1000 doses of the vaccine or 2 ampoules containing 500 doses each are added to a 200 cm³ vial of the diluent; 2 ampoules containing 1000 doses each or 4 ampoules containing 500 doses each are added to a 400 cm³ vial of the diluent.

Flasks with a diluent should be protected from the influence of direct sunshine and heating. While carrying out vaccination, flasks with the dissolved vaccine are stirred up at times up, without allowing sedimentation of cells and formation of foam.

Vials containing dry vaccine should be opened immediately before use and the contents are dissolved in 2 cm³ of the diluent for the dry vaccine against Marek's disease. The vaccine is transferred to a bottle with a diluent for dry vaccines against Marek's disease, according to asepsis rules. The flask is rinsed 2–3 times with a diluent and transferred to the general bottle with a diluent. Dry vaccine should be dissolved at the account of 1000 or 500 doses should be dissolved in 200 cm³ or 100 cm³ of the diluent, correspondingly. Distilled water for the concentrated diluent is sterilized by autoclaving at 1,1·10⁵ PA or by boiling for 30 minutes and cooled to the temperature +18±2° C.

The vaccine is administered intramuscularly in the inner thigh or percutaneously in the lower third of the neck at the dose of 0,2 cm³ via syringe or automatic injector.

Before vaccination syringes and needles are sterilized by boiling in the distilled water within 10–15 minutes, and injectors are disassembled, cleared, washed with the cooled boiled water, disinfected with 70%-m solution of ethyl alcohol and flamed.



Vaccinated chickens are kept separately from birds of other age groups for at least 3 weeks in order not to allow their infection with a "field" virus of Marek's disease. Apart from preventive vaccination in farm units affected by Marek's disease, veterinary sanitary measures should be taken to eliminate the causative agent in the environment, to prevent early infection of the chickens and enhance their resistance.

Storage conditions

Liquid vaccine is kept only in vessels of the Dewar or biological storages (ampoules should be completely dipped in liquid nitrogen). Vaccine storage in steams of nitrogen is not allowed!

A shelf life of a liquid vaccine is 24 months from the date of manufacturing under a condition regular refilling of vessels of the Dewar by liquid nitrogen (no rarely than 1 time in 5 days). A dry vaccine is kept and transported at temperature from +2 to +6° C. Shelf life of a dry vaccine – 12 months from the date of manufacturing.

A diluent is kept in a dry dark place at temperature from +8 to +12° C within 12 months. A vaccine is transported by all means of transport. Liquid – in vessels of the Dewar, accompanied by the instructed courier.





Assignment

Inactivated mono- and polyvalent "AVIVAC" vaccines are used for specific prevention of infectious bronchitis (IB), Newcastle disease (ND), infectious bursal disease (IBD), reovirus tenosynovitis (REO), egg drop syndrome 76 (EDS-76), adenoviral hepatitis with inclusions of hyperpericarditis of birds and methapneumoviral infection of birds.

General provision

Inactivated "AVIVAC" vaccines are homogenous water-oily emulsions of white or white-pink color. Partial stratification of an emulsion is allowed, it easy reintegrates when stirring.

Vaccines are packaged in flasks of 450 cm³ – 900 doses or on 500 cm³ – 1000 doses.

Optimal composition of the vaccines allows to achieve the required level of humoral antibodies to each of the antigens contained in the vaccine and to ensure their circulation in the bloodstream for 12 months.

"AVIVAC" vaccines are available in the mono-, bi-, tri- and quadrivalent forms.

Monovalent vaccines: "AVIVAC-IB", "AVIVAC-ND", "AVIVAC-ND-START", "AVIVAC-IBD", "AVIVAC-EDS-76", "AVIVAC-REO", "AVIVAC-ADENO", "AVIVAC-PNEUMO".

Bivalent vaccines: "AVIVAC-IB+ND", "AVIVAC-ND+REO", "AVIVAC-IB+IBD", "AVIVAC-IB+EDS-76", "AVIVAC-ND+IBD", "AVIVAC-ND+EDS-76", "AVIVAC-IBD+EDS-76", "AVIVAC-IB+REO", "AVIVAC-REO+EDS-76", "AVIVAC-IBD+REO", "AVIVAC-ND+PNEUMO".

Trivalent vaccines: "AVIVAC-IB+ND+IBD", "AVIVAC-IB+ND+EDS-76", "AVIVAC-IB+IBD+REO", "AVIVAC-ND+IBD+REO", "AVIVAC-ND+IBD+EDS-76", "AVIVAC-IB+IBD+EDS-76", "AVIVAC-IB+REO+EDS-76", "AVIVAC-ND+REO+EDS-76", "AVIVAC-IBD+REO+EDS-76", "AVIVAC-IB+ND+REO".

Quadrivalent vaccines: "AVIVAC-IB+ND+IB+EDS-76", "AVIVAC-IB+IBD+REO+EDS-76", "AVIVAC-IB+ND+REO+EDS-76", "AVIVAC-IB+ND+IBD+REO".



Vaccination schedule

Inactivated "AVIVAC" vaccines should be administered to birds aged 100 to 120 days, but at least 3–4 weeks before egg laying, to assure a sufficient antibody level during the productive period.

To enhance the specific protection of laying hens against IB and ND, chickens should be vaccinated with live vaccines before immunization with inactivated vaccines.

Vaccination order

Vaccines are applied in strict accordance with "The instruction on application of inactivated vaccine of the AVIVAC series".

For vaccination the vaccine of room temperature is used for the purpose of decrease in viscosity of an emulsion. Before application the vaccine is necessary for mixing carefully by stirring.

A preparation is administered in the volume of 0.5 cm³ by a method of a single injection into a chest muscle or hypodermically in the bottom third of a neck with observance of rules of an asepsis. Poultry meat is used without restriction in 28 days after vaccination.

Precautionary measures

It is not recommended to use for vaccination syringes with sealants from a materials on the basis of natural rubber, silicone or isobutyl derivatives as mineral oil being a part of an adjuvant destroys these materials.

Storage conditions

The vaccine is transported by all means of transport according to Rules of transporting of perishable cargoes and the luggage, operating on this means of transport.

The vaccine should be kept in a dry dark room, in boxes of an original packing or in transport container at temperature +4...+8° C within the expiration date. The shelf life of a vaccine is 18 months.



AVIVAC-PNEUMO

a vaccine against methapneumoviral infection of birds, inactivated

General provisions

The inactivated emulsive vaccine "AVIVAC-PNEUMO" is intended for specific prevention of birds against a metapneumoviral infection in breeding, commodity and other categories of poultry-farming units, and also for the compelled vaccination in unsuccessful and threatened farms for the purpose of reducing of the infection.

The vaccine "AVIVAC-PNEUMO" is made of an inactivated methapneumoviral infection virus of birds (a production strain of a subtype B) in a mix with an oil adjuvant.

The vaccine represents a homogeneous emulsion of white or light-pink color. At storage insignificant stratification of an emulsion in the top part of the bottle which uniformity is restored at agitation is allowed.

The vaccine is packaged in quantity of 900–1000 vaccine doses in glass or plastic flasks of the corresponding capacity.

Biological properties

Vaccine is inducing the immune answer of birds to a metapneumoviral infection 21 day after a single introduction which remains no less than 6 months.

The vaccine is innocuous, areactogenic, possesses no therapeutic properties.

Application order

Young herd replacements of hens at the age from 20 till 120 days are subject to vaccination. The vaccine is administered enter hypodermically into the middle third of a neck or intramuscularly in a chest muscle in volume of 0.5 cm³. Frequency rate of immunizations is defined by an epizootic situation. It is forbidden to impart clinically sick and/or weakened chickens.



Before the application a vaccine is taken from the refrigerating chamber and is kept for 3–4 hours at temperature $+20^{\circ}\text{C}$. The vaccine warming up on a water bath and on heating devices is forbidden. Before the application and at the usage time a flask with a vaccine is carefully shaken up. Vaccine is used within 2 hours after opening of a flask. For vaccination there are used sterile syringes and needles. A place of the injection is disinfected with 70% solution of ethyl alcohol or other disinfectant.

21 days after vaccination of birds there is carried out the intensity immunity control, by checking no less than 25 tests of blood serums. Vaccination is considered to be successful if no less than 80% of the imparted birds have a caption of antibodies to methapneumovirus not below two minimum positive values in ELISA. At the intensity of immunity less than 80% the birds are revaccinated.

The vaccine doesn't cause postvaccinal reactions. In isolated cases on a place of injection the formation of the small bulge disappearing in 2 weeks is possible.

Storage conditions

Shelf life is 18 months from the date of manufacturing. A vaccine is kept in a dry dark room at temperature from $+2$ to $+8^{\circ}\text{C}$ within the expiration date. Freezing of a vaccine is not allowed.





AVIVAC-ND-START

a vaccine against Newcastle disease,
inactivated

General provisions

The inactivated emulsive vaccine "AVIVAC-ND-START" is intended for specific prevention of birds against a metapneumoviral infection in breeding, commodity and other categories of poultry-farm units, and also for the compelled vaccination in unsuccessful and threatened farms for the purpose of reducing of the infection.

The vaccine is made of an inactivated virus of Newcastle disease birds (strain La-Sota) in a mix with an oil adjuvant. The vaccine represents a homogeneous emulsion of white color. At storage insignificant stratification of an emulsion in the top part of the bottle which uniformity is restored at agitation is allowed.

The vaccine is packaged in quantity of 4500–5000 vaccine doses in glass or plastic flasks of the corresponding capacity.

Biological properties

Vaccine is inducing the immune answer of birds to a Newcastle disease 7–14 days after introduction which remains no less than 3 months.

The vaccine is innocuous, areactogenic, possesses no therapeutic properties.

Application order

Chickens at the age from 1 till 10 days are subject to vaccination. The vaccine is administered once into the middle third of a neck. It is forbidden to impart clinically sick and/or weakened chickens.

A revaccination of chickens against a Newcastle disease is carried out with a live vaccine according to earlier fulfilled scheme practicing on farm without term of immunization of chickens with the inactivated vaccine.



Before the application a vaccine is taken from the refrigerating chamber and is kept for 3–4 hours at temperature $+20^{\circ}\text{C}$. The vaccine warming up on a water bath and on heating devices is forbidden. Before the application and in a usage time a flask with a vaccine is carefully shaken up. Vaccine is used within 2 hours after opening of a flask.

For vaccination there are used sterile syringes and needles. A place of the injection is disinfected with 70% solution of ethyl alcohol or other disinfectant.

14–21 days after vaccination of birds there is carried out the control of the intensity of the immunity to Newcastle disease, by checking no less than 25 tests of blood serums in HIR or ELISA. Vaccination is considered to be successful if no less than in 80% of the blood serum samples the antibody titer to the ND virus is no less than 1:16, at the ELISA test – no less than 2 minimal volumes. At the intensity of immunity less than 80% the birds are revaccinated with the live vaccine against ND.

The vaccine doesn't cause postvaccinal reactions. In isolated cases on a place of injection the formation of the small bulge disappearing in 2 weeks is possible.

Storage conditions

Shelf life is 18 months from the date of manufacturing. A vaccine is kept in a dry dark room at temperature from $+2$ to $+8^{\circ}\text{C}$ within the expiration date. Freezing of a vaccine is not allowed.





AVIVAC-RM

a vaccine against respiratory mycoplasmosis
inactivated, emulsive

General provisions

The inactivated emulsive vaccine "AVIVAC-RM" is intended for specific prevention of birds against respiratory mycoplasmosis (RM) of birds.

The vaccine is made of strain S_6 *M. gallisepticum* grown on artificial nutrition media. The vaccine represents a homogeneous emulsion of white or cream color.

The vaccine is packaged in flasks by volume 200 cm³, 450 cm³, and 500 cm³.

Biological properties

Vaccine is inducing the postvaccinal immunity of birds to respiratory mycoplasmosis 21–28 days after introduction, which remains during 6 months.

The vaccine is innocuous, areactogenic, possesses no therapeutic properties.

Application order

Vaccine is applied in strict accordance with "The instruction on application of inactivated emulsive vaccine against respiratory mycoplasmosis AVIVAC-RM".

Clinically healthy birds of egg and meat breeds, sensitive to mycoplasmosis are subject to vaccination, at the age of 5–7 weeks with the subsequent revaccination in 5–7 weeks age 3–4 weeks before the laying period.

Poultry meat is used without restriction in 28 days after an inoculation. Carcasses of the bird killed before this term, are subject to thorough veterinary and sanitary examination. At detection of the remains of not resolved vaccine or signs of an inflammation on a place of introduction carcasses are culled.



Storage conditions

The vaccine is kept in a dry dark room, in boxes of an original packing or transport container at temperature from +4 to +8° C within the expiration date. Freezing of a vaccine is not allowed. At storage of a vaccine the insignificant upholding of oil in the top part of the bottle having a yellowish coloring is allowed.

An expiration date – 18 months from the date of manufacturing.





AVIVAC-SALMO-COLI-PASTOVAK

a vaccine against
salmonellosis, colibacillosis
and pasteurellosis of birds,
inactivated

General provisions

The vaccine is made of surface antigens of virulent strain 115 P. multocida, S. enteritidis G-5-AT and adhesive antigens of toxigenic strains of 4Pol and 12CM E. coli mixed with oil adjuvant. The vaccine is produced in mono- or bivalent options.

The vaccine represents a homogeneous water-oil emulsion of white or white-pink color.

The vaccine is packaged in hermetically sealed flasks by volume 200, 450 and 500 cm³.

Biological properties

The vaccine causes development of specific antibodies to the causative agent of salmonellosis, colibacillosis and pasteurellosis in 14–28 days after immunization. Vaccinated birds' immunity is created by duration of 6–8 months. The vaccine provides safety of posterity from a salmonella-enteritidis infection during the first 14 days of life due to transferring of maternal antibodies.

The vaccine is innocuous, areactogenic, possesses no therapeutic properties.

Application order

Vaccine is applied in strict accordance with "The instruction on application of inactivated emulsive vaccine against salmonellosis, colibacillosis and pasteurellosis AVIVAC-SALMO-COLI-PASTOVAC".

Clinically healthy birds are subject to vaccination, beginning from the age of 30 days, revaccination is carried out in 90–110 days but not later than 3–4 weeks before the laying period.



Young herd replacements of hens are vaccinated against salmonellosis for the purpose of protection of the chickens received from the vaccinated bird, due to transovarial immunity. A bird is vaccinated twice at the age of 60–75 days after receiving negative serologic results on salmonellosis and in 2–4 weeks after the first vaccination, but no later than 3–4 weeks prior to the beginning of a laying period. Weak, sick, suspicious in a disease birds are culled before the vaccination.

The imulsive vaccine is administered only hypodermically into area of the top dorsal surface of breast in the doses specified in table 1.

Colibacillosis, pasteurellosis		
Kind of bird	Age (days)	Dose (cm ³)
Chickens	30–60	0.5
	61 and more	0.5
Turkeys, ducks, geese	30–60	0.5
	61 and more	0.5
Salmonellosis		
Young herd replacements	60–75	0.5
	75 and more	0.5

Immobilized vaccine is administered intramuscularly into a wing between elbow and radial bones in the doses specified in table 2.

Colibacillosis, pasteurellosis		
Kind of bird	Age (days)	Dose (cm ³)
Chickens	30–60	0.5
	61 and more	1.0
Turkeys, ducks, geese	30–60	1.0
	61 and more	2.0
Salmonellosis		
Young herd replacements	60–75	0.5
	75 and more	1.0

Meat from the vaccinated bird is used without restriction in 28 days after the vaccination, the eggs are used without restriction irrespective of vaccination terms.

Storage conditions

Shelf life of a vaccine is 18 months from the manufacturing date. It is forbidden to use a vaccine upon termination of the expiration date. A vaccine is kept in a dry dark room at temperature from +4 to +8° C. Freezing of a vaccine is not allowed.



LIVE VACCINES

No.	Name of preparation	Pharmaceutical form	General components of the preparation	Application method
1.	A vaccine against Newcastle disease, live, dry "AVIVAC-ND"	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Newcastle disease virus (st. La-Sota, Bor-74 and B.); 2. Stabilizing medium	Orally, intranasally, intraocularly, with aerosol
2.	A vaccine against chicken infectious bronchitis, live, dry "AVIVAC-IB"	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Chicken infectious bronchitis virus (st. H-120); 2. Stabilizing medium	Orally, intranasally, intraocularly, with aerosol
3.	A vaccine against chicken infectious bronchitis and Newcastle disease, live, dry "AVIVAC-IB+ND" Is produced in mono- and bivalent variants	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Chicken infectious bronchitis virus (st. H-120), Newcastle disease virus (st. La-Sota, Bor-74 and B.); 2. Stabilizing medium	Orally, intranasally, intraocularly, with aerosol
4.	A vaccine against chicken infectious bursal disease, live, dry "AVIVAC-IBD-M", "AVIVAC-IBD-AN", "AVIVAC-IBD-BG"	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Infectious Bursal disease virus (st. Winterfield-2512 of a high or low level of attenuation, st. BG); 2. Stabilizing medium	Orally
5.	A vaccine against chicken reovirus tenosynovitis, live, dry "AVIVAC-REO" with a diluent	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Reoviral infection virus (st. 1133); 2. Stabilizing medium; 3. Diluent	Percutaneously in the area of the lower third of neck
6.	A vaccine against infectious laryngotracheitis of birds, live, dry "AVIVAC-ILT"	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Infectious laryngotracheitis virus (st. VNIBP); 2. Stabilizing medium	Orally, intraocularly, with aerosol and cloacal
7.	A vaccine against pox of birds, dry, cultural "AVIVAC-POX" with a diluent	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Pox virus (st. K); 2. Stabilizing medium; 3. Diluent	By method of centesis of a wing web with 2-needle injector
8.	A vaccine against Marek's disease "AVIVAC-MAREK" with a diluent	Lyophilized material in glass flasks by volume of 5.0 cm ³	1. Herpes virus of turkeys (st. FS-126); 2. Stabilizing medium; 3. Diluent	Intramuscularly, percutaneously and to the embryo of 18 day of incubation term



INACTIVATED VACCINES

No.	Name of preparation	Pharmaceutical form	General components of the preparation	Application method
1.	Vaccine against Newcastle disease (ND), infectious bronchitis (IB), infectious bursal disease (IBD), egg drop syndrome (EDS-76), reovirus infection (REO) inactivated "AVIVAC" Produced in mono-, bi-, tri- and tetravalent combinations	Water-oil emulsion in glass or plastic flasks by volume 450–500 cm ³	1. Inactivated viruses of Newcastle disease (st. La-Sota), infectious bronchitis (st. Chapaevsky), infectious bursal disease (st. 52/70-M), egg drop syndrome (st. B8/78) and reovirus infection (st. 1733); 2. Oil adjuvant	Percutaneously in the area of the lower third of neck
2.	Vaccine against adenoviral hepatitis with inclusions – hydropericarditis of birds, inactivated "AVIVAC-ADENO"	White or white-beige emulsion in glass or plastic flasks by volume 40–1000 commercial doses	1. An inactivated virulent st. of ADV of an adenoviral hepatitis virus with inclusions – hydropericarditis of birds; 2. Oil adjuvant	Percutaneously in the area of the lower third of neck
3.	A vaccine against methapneumoviral infection of birds, inactivated "AVIVAC-PNEUMO"	White or light-pink emulsion in glass or plastic flasks by volume 900–1000 intraocular doses	1. An inactivated methapneumoviral infection virus of birds (a production st. of a subtype B); 2. Oil adjuvant	Percutaneously in the area of the middle third of neck or intramuscularly
4.	A vaccine against Newcastle disease, inactivated "AVIVAC-ND-START"	White emulsion in glass or plastic flasks by volume 900–1000 intraocular doses	1. Inactivated virus of Newcastle disease (st. La-Sota); 2. Oil adjuvant	Percutaneously in the area of the middle third of neck of chickens of 1–10-day age
5.	A vaccine against respiratory mycoplasmosis inactivated, emulsive "AVIVAC-RM"	Water-oil emulsion in glass or plastic flasks by volume 450–500 cm ³	1. Inactivated mycoplasmosis cells of strain S ₆ M. gallisepticum; 2. Oil adjuvant	Percutaneously in the area of the lower third of neck
6.	A vaccine against salmonellosis, colibacillosis and pasteurellosis of birds, inactivated, emulsive "AVIVAC-SALMO-COLI-PASTOVAC" Produced in mono- and bivalent combinations	Water-oil emulsion in glass or plastic flasks by volume of 200, 450, 500 cm ³	1. Inactivated: virulent st. P. multocida, S. enteritidis C-5-AT and adhesive antigens of toxigen strains of E. coli; 2. Oil adjuvant	Percutaneously in the area of the lower third of neck



ELISA kits of "AVIVAC" series

AVIVAC Ltd. produces and realizes the test systems intended for laboratory diagnostics of most widespread and dangerous infectious diseases of birds.

Newcastle disease is a contagious, widespread virus disease of birds, being characterized by defeating of respiratory and nervous system, and also other internal organs. It proceeds in the form of an enzootic, epizootic, panzootic way; in sharp, latent, atypical or sub clinical forms. At a sharp clinical course lethality among growing stock of a bird reaches 100%, the laying ability decreases to 45–60%. The Newcastle disease belongs to especially dangerous infections, and if it arises quarantine is established at farm units.

Chicken infectious bronchitis is a contagious disease of chickens proceeding in a sharp form and being characterized by a very short incubation period (24–72 hours). Clinically the disease occurs by defeat of respiratory organs, kidneys, a urogenital path at chickens and a reproductive path with the laying ability decreases at adult hens. At 30-day age chickens mortality can reach 28–31%. At chickens 1–5-month's age infectious bronchitis in most cases proceeds chronically and becomes complicated by other infectious diseases, mainly of bacterial etiology. Economic losses are generally stipulated by decrease in meat and egg productivity, by compelled cull of birds reaching 40–60% and more and sharp decrease in percent of chickens reared per pullet.

Infectious bursal disease, Gumboro disease is a sharply proceeding contagious disease affecting mainly chickens of 2–15-week age. It is characterized by a depression, diarrhea, and defeat of a bursal sac, kidneys, and wide intramuscular hemorrhages. It is accompanied



by generalized immune suppression reducing the immune status of an organism and raising its sensitiveness to secondary virus and bacterial infections. Incidence reaches 100%, mortality – 50% and above. The economic damage develops of death of a bird, high percent of a cull of carcasses as a result of exhaustion, hypodermic and intramuscular hemorrhages, decrease in efficiency of vaccination, decrease of resistance of a livestock to other activators, costs of elimination and disease prevention.

Reovirus infection of birds is a virus disease of chickens, which symptoms are: the lameness caused by an aseptic inflammation of sinews and joints of limbs, low mobility, a growth inhibition, high early mortality, bad comprehensibility of forage, an integument degeneration, diarrhea, peritonitis, decrease in egg laying ability for 15–20%. Manifestation of clinical signs in many respects depends on the age of birds, virulence of a virus and duration of the incubatory period.

Infectious encephalomyelitis of birds (an epizootic tremor) – sharply proceeding viral disease of the chickens, being characterized by head and neck trembling, disruption of coordination of movements, paresis of extremities, and also high incidence and the mortality reaching in some cases 60–90%. At an adult bird the disease proceeds without symptoms, however, at laying hens decrease in an egg laying ability (up to 30%) is observed. The activator extends transovarially, however horizontal transfer from the infected bird to susceptible chickens and hens is possible. The economic damage includes losses from a case of a bird, decrease of productivity, reduction of deductibility of chickens and costs of prevention of disease elimination.

Leucosis of birds is a widespread disease of birds which etiological agent is the retrovirus, being accompanied by formation of tumors, an immune suppression of an organism, and decrease in efficiency and increase in mortality of the infected livestock. Due to the long incubatory period breeding farms and egg farms generally suffer. At a sharp clinical course the increase in bursa, a liver and other parenchymal organs is observed. Livestock monitoring in poultry-farm units is carried out by means of ELISA with the use of antibodies to protein p27 which is general for all retroviruses of birds.

Respiratory mycoplasmosis is a chronic infectious disease of hens which is caused by *Mycoplasma gallisepticum*. It is accompanied by defeat of respiratory organs (guttural rale, exudates from nostrils, swelling of an infraorbital sinus, air sac infections), exhaustion and efficiency loss. Activator is spread transovarially and by a contact. Mortality is at the rate of 5–40%. Economic damage is caused by mortality of birds and embryos, an arrest of development and growth of chickens, high percent of a withdrawal of young growth from the compelled slaughter, decrease egg laying ability of hens.

Infectious synovitis is the infectious disease of hens caused by *Mycoplasma synoviae*. The disease proceeds in a sharp and chronic form and is accompanied by defeat of tendinous vaginas, and also joints of extremities and lameness. In some cases at the infected birds there is noted an inflammation of auriferous bags. Distribution of the infection occurs, mainly, transovarially and an aerogenic way. Incidence of disease is 5–15%, mortality does not exceed 10%. The economic damage is caused by a decrease of the productivity of birds



raised by death of embryos at the end of term of incubation, the compelled cull of birds, especially cocks.

The avian flu (GP) – the avian flu activator is an Orthomyxoviridae family virus – is quite steady in environment and can be transferred to a healthy bird as at contact to patients and virus carriers, and a mechanical way through transport and the equipment, and also the personnel. Clinical signs at an avian flu are non-specific: the disheveled plumage, eggs with a soft shell, a depression and slackness, low appetite, blood or other inclusions in protein or a yolk of eggs, cyanosis of a crest and ear rings, also swelling of the head, ear rings and a crest, joints, diarrhea of green color, the bloody expirations from nasal and oral cavities, violation of coordination of movement, dot hemorrhages on skin (most easier defined on not feathered parts of body – legs, etc.) the respiratory phenomena, sudden death of a large number of birds in herd.

The ELISA method has a number of advantages in comparison with other laboratory tests: high sensitivity and specificity, stability of reagents, a rapidity and automation possibility at carrying out mass diagnostic researches. It allowed the immunoassay analysis to take a leading place in temporary diagnostic and research laboratories. In theoretical and applied aspects development and improvement analytic methods of the immunoassay (ELISA first of all) with the use of poly- and monoclonal antibodies are necessary not only for express diagnostics, an assessment of the immune status of an organism or immunological efficiency of vaccine preparations, but also for studying of mechanisms of formation of immunity and a role of immune reactions in pathogenesis of infectious diseases, age formation of immune system at different animal species and birds.

All test systems for diagnostics of infectious diseases of birds by an ELISA method (ELISA kits) are intended for identification of specific antibodies to the corresponding antigen (to NB, IEM, IB, IBD, REO, GP, to causative agents of mycoplasmosis of birds (*Mycoplasma gallisepticum* and *Mycoplasma synoviae*) or is direct for identification of an antigen (a virus of leucosis of birds).

Use of ELISA AVIVAC test systems gives the chance to carry out as single diagnostic researches, and to carry out large-scale immunologic monitoring of a livestock in various poultry-farm units that allows to define a role of this or that activator in epizootic process and pathogenesis of each separate infectious disease at various forms of a course of an infection.

Characteristics of ELISA kits

High specificity and sensitivity are caused by use affinity purified specific antibodies and antigens, application alkaline phosphate as a fermentative label and R-nitrophenylphosphate as the main component of a substrate mix.

Reliability and reproducibility of results are caused by use of the standardized immunological and chemical reagents, micropanels and dissolvent. For increase of reliability and reproducibility of results in all kits, besides positive and negative control, the standard is



used – a certified preparation at the international level, containing strictly defined quantity of specific antibodies or an antigen.

Simplicity of statement and speed of carrying out analysis. Completing of sets is made by micropanels ready to application, solutions of conjugate and substrate. Incubation time between stages makes 30 minutes, the general time of statement of reaction – 2–2.5 hours taking into account all necessary procedures.

Obtaining of authentic quantitative data in the analysis of individual dissolvent with the use of standard as calibration test and a cart – a possibility of their automated processing.

Completing of diagnostic test systems

The structure of each set includes immunospecific and chemical components:

1. Polystyrene 96-well micropanels with adsorbed inactivated antigens in wells – 2 micropanels on each antigen. Every micropanel contains 12 demountable 8-well strips and has the color fringing, corresponding to each virus antigene.
2. A standard – (blood serum of hens with the raised maintenance of specific antibodies to the corresponding viral antigen) – 1 test tube.
3. Positive control – (blood serum of hens, containing specific antibodies to the corresponding viral antigen) – 1 test tube.
4. Negative control – (blood serum of hens, not containing specific antibodies) – 1 test tube.
5. Anti-specific conjugate – (antibodies to IgG of hens, marked by alkaline phosphate) – 1 flask.
6. The buffer for cultivation of examined and control tests – (concentrated 4-fold solution TRIS-EDTA of the buffer with addition of food dye) – 3 flasks.
7. The flushing buffer – (the concentrated TRIS 20-fold solution of buffer) – 2 flasks.
8. A substrate – (solution of R-nitrophenylphosphate) – 1 flask.
9. Stop solution – (3.0 M of NaOH, solution for a reaction stop) – 1 bottle.
10. Instruction on application.

Order of application

ELISA kits are applied according to "The instruction on application of a kit" to each disease. It is forbidden to mix components of sets of different series.

Storage conditions

The expiration date of components of a kit – 12 months from manufacturing date, under condition of storage and transportation in the place protected from light at temperature from +2 to +8° C. Freezing of components is not allowed.

Software

Software ELISA–AVIVAC (version 1.0) is developed for automatic processing, account and interpretation of results of ELISA received at carrying out diagnostic researches. Software ELISA–AVIVAC allows:



- to carry out data input (optical density) from spectrophotometer (reader) and from the computer keyboard;
 - to carry out automatic processing of results of measurements according to its algorithm, containing in manual on application of each ELISA kit;
 - to form databases as primary (optical density), and processed (results of researches) with search possibility in databases on the most various parameters (the researcher, name of ELISA kit, the disease or activator name, the description of analyzed test, date of carrying out the analysis etc.);
 - to represent the fast message on the carried out research (with printing possibility), including data on the researcher, ELISA kit, the disease or activator name, the description of analyzed tests, date of carrying out the analysis, and also value of optical density for each control sample and analyzed test, EU value (international ELISA-units, characterizing the relative maintenance of antibodies' antigen) for each analyzed test and result interpretation.
- Software ELISA–AVIVAC is compatible to various models of spectrophotometers (readers) both domestic (Uniplan), and import production (SLT Spectra, Anthos, Tesan and others).
SPE AVIVAC makes and realizes for veterinary practice test systems of the AVIVAC series on the basis of various options of ELISA.

ELISA kits for identification a virus-specific antibodies in blood serum of hens

Include all necessary components intended for definition of level of antibodies to viruses of encephalomyelitis of birds (EP), chicken infectious bronchitis (IB), an infectious bursal disease of birds (IBD), a Newcastle disease (ND) and reovirus of birds (RVP).

Principle of method. The method is based on use of indirect solid face ELISA at which the virus antigen whether adsorbed in wells of polystyrene micropanel, contacts the specific antibodies which are present in blood serum therefore the antigen antibody complex is formed. The received immune complex comes to light after interaction with anti-specific conjugate (antibodies to IgG of hens, marked by alkaline phosphatase) which enzyme after addition of a substrate causes decomposition of substrate-indicator solution and formation of the soluble painted product. Thus intensity of coloring of solution in a well of the micro-panel is proportional to the quantitative maintenance of antibodies in a studied material.

The main indicators of quality of kits

Indicators	Kits for detecting of antigens to viruses				
	ND	IB	REO	EP	IBD
Sensitivity, %	91*/100**	92*/95**	100*/87**	100*/96**	92*/94**
Specificity, %	84*/90**	100*/100**	77*/100**	80*/79**	93*/100**
Variation index ***, %	<10	<10	<10	<10	<10

* – at comparison with results of tests of "a gold standard" (HIR – for ND and IB; RN – for RVP and IBD; RDP – for EP);



** – at comparison with the results received by means of the corresponding ELISA kits of production KPL company (USA);

*** – at comparison of the results received with use of sets of different series.

ELISA kits for identification of specific antibodies to causative agents of mycoplasmosis of birds in blood serum of hens and yolks of eggs

Include all necessary components intended for definition of level of antibodies to causative agents of mycoplasmosis of birds of *Mycoplasma gallisepticum* (MG) and *Mycoplasma synoviae* (MS) in blood serum of hens.

Principle of method. The indirect solid phase ELISA which principle is similar to the aforesaid is used, but instead of a virus antigen in wells of the polystyrene micropanel one of mycoplasmosis antigens is adsorbed.

The main indicators of quality of kits

Indicators	Kits for detecting of antigens to viruses	
	MG	MS
Sensitivity, %	90*/93**	82*/85**
Specificity, %	100*/98**	91*/87**
Variation index *** , %	<10	<10

* – at comparison with results of tests of "a gold standard" (HIR – for ND and IB; RN – for RVP and IBD; RDP – for EP);

** – at comparison with the results received by means of the corresponding ELISA kits of production KPL company (USA);

*** – at comparison of the results received with use of sets of different series.

ELISA kit for identification of an antigen of a virus of leucosis of birds in blood serum and in protein of eggs of hens

Includes all necessary components intended for identification of an antigen of a virus of leucosis of birds (VLB) in blood serum and in protein of eggs of hens.

Principle of method. The method is based on use of ELISA at which antibodies to a group specific antigen p27 VLB adsorbed in wells of the polystyrene micropanel, communicate with p27 VLB antigenome in a studied material therefore the complex antigen – an antibody is formed. The received immune complex comes to light after interaction with conjugate (IgG-antibodies to p27 VLP, marked by alkaline phosphatase) which enzyme after addition of a substrate causes decomposition of a substratum-display solution and forming of the painted product. Thus intensity of coloring in a well of the micropanel is proportional to containing of a virus in a studied material.

Main indicators of quality of a kit. Fundamental indicators of quality control of a set – sensitivity and specificity – are 98 and 94% correspondingly (at comparison with the results received by means of similar ELISA kit of production of KPL firm). At comparison of the results received with use of kits of different series, the factor of a variation is <10%.



The kit for diagnostics of a Newcastle disease (ND) in HIR

Assignment

The kit is intended for identification of specific antibodies (antihemagglutinines) to a virus of a Newcastle disease (ND) in blood serums of hens and yolks of eggs in reaction of braking of a hemagglutination at an assessment of an epizootic situation and for control of intensity of postvaccinal immunity of a bird to this disease.

Completing

The structure of sets includes immunospecific and chemical components:

1. Inactivated antigen of ND disease – 3 flasks.
2. Positive control – hyper immune blood serum of hens to ND virus – 1 flask.
3. Negative control – blood serum of hens having no specific antibodies to ND virus – 1 flask.
4. Instruction on application.

Application order

HIR with components of a kit is set by the standard technique.

For diagnosis statement of a disease 20–30 tests of blood serum from birds of different age in volume of 0.5–1.0 cm³ everyone are delivered to laboratory. Blood is taken from a bird with suspicion on ND disease with an interval of 14–20 days. At the same time non-standard (decalcified, depigmentory) egg is delivered in quantity of 20–30 pieces from hen house.

For determination of intensity of postvaccinal immunity blood serum from vaccinated bird livestock received through 4–7 weeks after vaccine application is delivered to laboratory.

For the analysis of egg thee are used only yolks from which there are prepared extracts by the following technique: 1.5 cm³ of a yolk is suspended in a test tube from 6.0 cm³ of physical solution (pH 7.2–7.4). Then to test tubes there are brought 2.0 cm³ of dichloroethylene and 1.0 cm³ of ether for an anesthesia, rubber jams are closed, a mix is intensively stirred in the device for stirring during 10–15 minutes, then is placed in the thermostat at +37° C for 1 hour, with periodical stirring up of the contents of test tubes. Then a centrifuging is made at 2000 rpm within 15 minutes. Supernatant liquid is the extract of a yolk in initial dilution 1:5 and is used for the further analysis.

The account and an evaluation of the results

The account of reaction should be begun with the accounting of controls. Only at satisfactory results of control reaction it is possible to consider the results of the main reaction.



Detection of specific antibodies (antihemagglutinines) in studied tests of serums in titer 1:16 and above or in yolks of eggs in titer 1:10 and is higher at livestock in farms where specific prevention of ND was not carried out, without clinical and the pathoanatomical symptoms of a disease, indirectly testifies to circulation of field lentogenic strains of a virus of a Newcastle disease and is not the basis for the economy announcement to be unsuccessful because of a Newcastle disease. Continuous supervision for birds of such farms is established.

Titration of pair blood serum samples of extracts of a yolk of eggs and identification of no less than 4-fold gain of antibodies in 50% and more of studied tests, gives the grounds for diagnosis statement on ND. If the gain of a titer of antibodies in the studied tests material did not reach quadruple value or is revealed to be less than in 50% of cases, the economy is considered conditionally unsuccessful and doubled number of tests of a material for repeated serologic research is sent to laboratory.

Postvaccinal immunity considers to be intense if after application of inactivated vaccines specific antibodies titer to a virus ND will be 1:32 and above, no less than at 80–90%, and after application of live vaccines 1:16 and above, no less than at 80% of the studied tests of blood serums. If results of control are not satisfactory, repeated serologic researches are carried out and when receiving analogic results this party of birds is revaccinated.

Detection in HIR high titer of antibodies (1:1024 and higher at the birds inoculated with live vaccines and 1:8192 and higher at the birds inoculated by inactivated vaccines) indirectly testifies a possible circulation of a Newcastle disease in herd of a field virus.

In such cases there is carried out a continuous supervision after birds and in 21–30 days there is carried out a repeated research of tests of blood serum, received from the same birds.

Decrease or stabilization of level of antibodies and (or) reduction of quantity of birds with high level of antibodies at repeated researches of tests of blood serum indirectly testifies to absence of circulation in an economy of an epizootic virus and is a consequence of postvaccinal reactions.

Increase of titers and (or) increase in quantity of birds with high level of antibodies in the presence of clinical and pathoanatomical symptoms of a disease serves as a basis for carrying out detailed epizootologic inspection of an economy and establishment of the final diagnosis on this disease.



The evaluation of results at detection of specific antibodies to a virus of a Newcastle disease (ND) in reaction of braking of hemagglutination

The studied material		Antibody titers	Results evaluation	
Blood serum of birds	Not vaccinated livestock (paired blood serums)	4-fold increase of antibodies at 50% and more	clinical and pathoanatomic signs of ND	absence of clinical signs
			is the basis of carrying out of the detailed epizootic research of farm unit	is not the basis for announcing the farm unsuccessful in the view of the Newcastle disease
	Not vaccinated livestock	1:16 and more	is the basis for carrying out a detailed epizootic research of a farm unit	is not the basis for announcing the farm unsuccessful in the view of the Newcastle disease
	Vaccinated with live vaccine	1:16 and more, no less than 80%	postvaccinal immunity is considered to be intense	
		1:1024 and more	the circulation of the field virus in herd is possible, after 21–30 days a research is held	
	Vaccinated by inactivated vaccine	1:32 and more, no less than 80–90%	postvaccinal immunity is considered to be intense	
		1:8192 and more	the circulation of the field virus in herd is possible, after 21–30 days a research is held	

Storage conditions

Expiration date is 18 months from the date of manufacturing under condition of storage and transportation in a dry dark place at temperature +4...+8° C.



The kit for diagnostics of an egg drop syndrome – 76 (EDS-76) in HIR

Assignment

The kit is intended for identification of specific antibodies to the virus EDS-76 in blood serums of birds and yolks of eggs, retrospective diagnostics EDS-76 on humoral level and yolk antibodies, estimates of efficiency of immunization of hens against this disease, serological control of EDS-76 activator distribution on population of agricultural birds.

Completing

The structure of sets includes immunospecific and chemical components:

1. Inactivated antigen of EDS-76 disease – 3 flasks.
2. Positive control – hyper immune blood serum of hens to EDS-76 virus – 1 flask.
3. Negative control – blood serum of hens having no specific antibodies to EDS-76 virus – 1 flask.
4. Instruction on application.

Application order

HIR with components of a kit is set by the standard technique.

For diagnosis statement of a disease 20–30 tests of blood serum from birds of different age each in volume of 0.5–1.0 cm³ are delivered to laboratory. Blood is taken from a bird with suspicion on ND disease with an interval of 14–20 days. At the same time non-standard (decalcified) egg is delivered in quantity of 20–30 pieces from hen house.

For determination of intensity of postvaccinal immunity blood serum from vaccinated bird livestock received through 4–7 weeks after vaccine application is delivered to laboratory.

For serological control of the diffusion of the agent of EDS-76 syndrome 20–30 samples of blood serum in volume on 0.5–1.0 cm³ which have been selected from not vaccinated birds are sent to the laboratory.

The account and evaluation of the results

Accounting of results of reaction is carried out visually after complete subsidence of erythrocytes in control wells (in the form of "button") in the absence of spontaneous agglutination of erythrocytes and serum isoagglutination.

Retrospective diagnosis of EDS-76

Detection of no less than 4-fold gain of specific antibodies in 50% and more of pair tests of blood serum selected with an interval of 14–21 days from the birds suspected of disease EDS-76, gives the grounds for diagnosis statement on this disease.



If the gain of antibody titer in the studied tests did not reach a 4-fold gain or it is revealed less than in 50% of cases, the economy is considered conditionally unsuccessful and doubled number of tests of blood serum and eggs from the birds suspected of disease EDS-76 are send to laboratory for repeated research.

Receiving similar results at repeated research of materials is not the basis for statement of the positive diagnosis on EDS-76.

Evaluation of postvaccinal immunity

By results of HIR there is defined an efficiency of immunization of party of the inoculated hens by division of total number of tests with a caption of antibodies 1:32 and more on total number of the studied serums and is expressed as a percentage. A bird is considered to be immune to the virus EDS-76 at efficiency of immunization of 80% and more.

When receiving unsatisfactory results there is carried out repeated serological researches in 10–14 days and is done the final conclusion about effectiveness of the carried out immunization.

Serological control of EDS-76 activator distribution

Detection of specific antibodies in studied tests of blood serum in titer 1:16 and more in farms where specific prevention of EDS-76 is not carried out, testifies to circulation of the field EDS-76 activator and unsatisfactory condition on this disease of poultry farms.

Storage conditions

Expiration date is 18 months from the date of manufacturing under condition of storage and transportation in a dry dark place at temperature +4...+8° C.





The kit for diagnostics of respiratory mycoplasmosis of birds in reaction of agglutination (RA)

Assignment

The kit is intended for intravital diagnostics of respiratory mycoplasmosis of birds, defining the level of infection of herd and control of the results of prevention measures carried out on poultry farms.

Completing

The structure of sets includes:

1. Liquid antigen of mycoplasma gallisepticum of strain S_6 – 1 flask, 10 ml.
2. Lyophilized positive control blood serum to strain S_6 – 1 flask.
3. Lyophilized negative control of blood of chickens – 1 flask, 1 ml.

Application order

For research there is used blood serum of the hens, received by the standard method. Reaction of agglutination is put on well washed up, fat-free and wiped dry subject slides. Antigen control is put with positive and negative serums.

Positive RA is characterized by formation of clots (flakes) and full lucidification of a mix of reagents.

Evaluation of the results is made with account of the following:

Quantity of serological researches	Quantity of positive samples	Infection rate of a livestock, %
20	14	100
20	2	40
30	2	30
40	2	20
100	5	10

Storage conditions

Expiration date of antigen and control serums is 12 months from the date of manufacturing under condition of storage and transportation in a dry dark place at temperature +4...+8° C.



The structure of AVIVAC Ltd. includes the Diagnostic Center which main activity is diagnostics of infectious diseases of birds and development of effective actions for prevention and fight against them.

The center carries out diagnostic researches on such to the most dangerous and wide-spread diseases of birds, as:

- avian flu;
- chicken infectious bronchitis;
- infectious laryngotracheitis;
- infectious encephalomyelitis;
- pneumovirus infection;
- adenovirus infection;
- reovirus tenosynovitis;
- mycoplasmosis;
- ornithosis (chlamydiosis);
- pasteurellosis;
- coccidial infection;
- Newcastle disease;
- an infectious bursal disease;
- Marek's disease;
- viral anemia of chickens;
- paramixoviral infection;
- egg drop syndrome – 76;
- leucosis sarcoma diseases;
- ornitobacteriosis;
- colibacteriosis;
- salmonellosis;
- mycosis, mycotoxicosis and other diseases.

The center is completed by highly skilled experts and equipped with the temporary equipment. In work of the Center highly sensitive and specific test systems on the basis of immunoferrmental, immunochromatografic, molecular and biological, and also traditional methods of research are used. All this allows carry out diagnostic and differential researches given with a fine precision and at the shortest terms.

The staff of the Center improved work on statement of the preliminary express diagnosis on the main infectious diseases of birds which are accompanying by sudden recessions of egg efficiency and laying of non-standard eggs (by GP, ND, IB, IEM, EDS-76, PVI, ILT, MG, MS, etc.). It is reached as a result of use in serological reactions (ELISA, HIR) for detection of antibodies not only blood serum, but also in egg yolks and yolk follicles of birds. These researches allow establishing operatively epizootic trouble of poultry farm – suppliers of raw materials for bioproduction, suppliers of commodity egg, to determining the degree of purity of farms, possible trouble caused by infectious diseases of separate species of a syntropic, wild, upland and exotic bird.

Specialists of the center conduct epizootic survey of farms. They provide scientific and practical help in setting of the diagnosis on infectious and a noncontagious etiology with development of recommendations about decrease in a damage from them, develop optimum schemes of application of means of specific prevention and chemotherapeutic preparations.

At statement of the diagnosis and development of anti-epizootic actions in every case breeding features of a bird are taken into account, as well as technology of keeping and



feeding, impact on a bird of stressful and immunosuppressive factors, efficiency of programs of vaccinal prevention of infectious diseases of birds on farms of various regions of the country and the world are considered.

In the diagnostic center SPE "AVIVAC" it is possible to receive the advisory help in an assessment of results of diagnostic researches on infectious diseases of the birds executed at any level, to undertake an internship concerning infectious pathology of birds.

A long-term research-and-production experience in the market of veterinary services for industrial poultry farming is a guarantee of our reliability.

We are sure of efficiency of our offers and are ready to business partnership.





AVIVAC Ltd. puts special attention to veterinary support of the production manufactured.

Veterinary service includes a comprehensive approach to diagnostics of infectious diseases taking into account the results of serological monitoring for evaluation of the epizootic situation of poultry farms, the analysis of schemes of veterinary processing of a bird taking into account technological parameters of growing and keeping of birds and laboratory diagnostics with carrying out serological, virologic, histologic and microbiological researches.

AVIVAC Ltd. has the Advisory Diagnostic & Training Centre. The activity of the Center is based on complex approach to diagnostics of infectious diseases taking into account epizootic situation in the region and technological parameters of poultry operation and management.



The centre carries out diagnostic studies on most important infection diseases:

- Newcastle disease (ND)
- infectious bronchitis of hens (IBH)
- infectious encephalomyelitis (IEM)
- avian influenza (AI)
- paramyxovirus infection (PMVI)
- avian leucosis & sarcomas (ALS)
- colibacillosis
- salmonellosis
- coccal infections
- coccidiosis
- infectious bursal disease (IBD)
- infectious laryngotracheitis (ILT)
- reovirus tenosynovitis (RTS)
- adenovirus infection (AVI)
- Marek's disease (MD)
- mycoplasmosis (G and S)
- pasteurellosis
- pseudomoniasis
- histomoniasis
- mycosis, mycotoxicosis and other.

The applied modern hardware, software and highly-specific diagnostic test kits based on enzyme immunoassay, enzyme immunochromatographic assay and polymerase chain reaction as well as on traditional laboratory methods, provide the possibility to obtain fast and reliable results. Specialists of the Center will provide you with qualified advises on obtained results, allowing to make correct estimation of epizootic situation on the farm and to develop an efficient program of prophylaxis and treatment of poultry diseases.

Specialists of Advisory & Diagnostic Centre highly appreciate feedback cooperation with veterinary specialists of the farms and analyze the effectiveness of their programs of preventive vaccination applied in different regions of the country.

Upon your request, specialists of our Center will determine biological activity of vaccines produced by different manufacturers.

All biological products developed and produced by us are registered and certified.

The enterprise has the qualified experts, among them there are professors, doctors and candidates of science, whose experience and high professionalism allow making high-quality biological products and to give a scientifically proved consulting.

Specialists of AVIVAC Ltd. regularly visit poultry farms, where they carry out a complex epizootic monitoring which includes: clinical survey of a livestock, pathoanatomic opening of the fallen bird, material selection for laboratory researches, the analysis of fodder diets, and also carry out the evaluation of conditions of keeping and feeding of birds depending on technological direction of the farm. On the basis of results of diagnostic researches the evaluation of the program of vaccination existing on a farm is carried out and its adjustment is made if necessary. By results of a complex inspection of an economy by experts, necessary recommendations about improvement of an epizootic situation and, as a result of it, increase economic effectiveness of the enterprise.

We ensure the effectiveness of our proposals and are ready for business cooperation.

Our reliability is guaranteed by many years of scientific & production experience in the market of biological products and veterinary services!

Now "AVIVAC" is the brand identity of quality, attesting the high level of a demand and reliability.



LIVE VACCINES

DESCRIPTION	COMPOSITION	ADMINISTRATION
AVIVAC IB-H-120		
Freeze-dried live vaccine against Infectious Bronchitis	One dose contains: min. $10^{3.5}EID_{50}$ IB virus, serotype Massachusetts strain H-120	Drinking water, spray, intranasal, intraocular
AVIVAC ND-La Sota & AVIVAC ND-Bor-74		
Freeze-dried live vaccine against Newcastle Disease	One dose of AVIVAC ND-Lento La-Sota contains: min. $10^{6.7}EID_{50}$ ND virus, strain La-Sota; One dose of AVIVAC ND-Lento Bor-74 contains: min. $10^{6.0}EID_{50}$ ND virus, strain Bor-74 VGSKI	Drinking water, spray, intranasal, intraocular
AVIVAC IB-ND La Sota		
Freeze-dried live vaccine against Infectious Bronchitis and Newcastle Disease	One dose contains: min. $10^{3.5}EID_{50}$ IB virus, serotype Massachusetts strain H-120 and min. $10^{6.5}EID_{50}$ ND virus, strain La-Sota	Spray, intranasal, intraocular
AVIVAC IBD-M & AVIVAC IBD-BG		
Freeze-dried live vaccine against Infectious Bursal Disease	One dose of AVIVAC IBD-M contains: min. $10^{4.0}TCID_{50}$ IBD virus, strain Winterfield 2512; One dose of AVIVAC IBD-BG contains: min. $10^{3.0}EID_{50}$ IBD virus, strain BG	Drinking water
AVIVAC REO		
Freeze-dried live vaccine against Viral arthritis / tenosynovitis	One dose contains: min. $10^{4.0}TCID_{50}$ REO virus, strain S1133	Subcutaneous injection
AVIVAC ILT		
Freeze-dried live vaccine against Infectious laringotracheitis	One dose contains: min. $10^{3.0}EID_{50}$ ILT virus, strain VNIIBP	Drinking water, aerosol, intraocular
AVIVAC Marek 1+3 & AVIVAC Marek 3		
Live vaccine against Marek's Disease, cell-associated, aqueous suspension, with a diluent	One dose of AVIVAC Marek 1+3 contains: Live MD CHV strain CVI 988 $>3.0 \log^{10}$ pfu Live MD THV strain FC-126 $>3.0 \log^{10}$ pfu; One dose of AVIVAC Marek 3 contains: Live MD THV strain FC-126 $>3.0 \log^{10}$ pfu	Intramuscular or subcutaneous injection
AVIVAC Marek 3 Iyo		
Freeze-dried live vaccine against Marek's Disease, with a diluent	One dose contains: Live MD THV strain FC-126 $>3.0 \log^{10}$ pfu	Intramuscular or subcutaneous injection
AVIVAC POX		
Freeze-dried live vaccine against Fowl pox, with a diluent	One dose contains: min $10^{3.0}ID_{50}$ /0.015 ml fowl pox virus	Intracutaneous after dissolving in the solvent supplied



INACTIVATED VACCINES

DESCRIPTION*	COMPOSITION	ADMINISTRATION**
AVIVAC EDS-76		
Oil emulsion vaccine against Egg Drop Syndrome '76	Active components: Inactivated Egg Drop Syndrome '76 virus strain B8/78 in water-in-oil emulsion	Subcutaneous injection
AVIVAC IB		
Oil emulsion vaccine against Infectious Bronchitis	Active components: Inactivated Infectious Bronchitis virus serotype Massachusetts strain Chapaevsky in water-in-oil emulsion	Subcutaneous injection
AVIVAC ND		
Oil emulsion vaccine against Newcastle Disease	Active components: Inactivated Newcastle Disease virus strain La Sota in water-in-oil emulsion	Subcutaneous injection
AVIVAC IB D		
Oil emulsion vaccine against Infectious Bursal Disease	Active components: Inactivated Infectious Bursal Disease virus strain BG in water-in-oil emulsion	Subcutaneous injection
AVIVAC REO		
Oil emulsion vaccine against Reovirus infection	Active components: Inactivated Reovirus infection virus strain 1733 in water-in-oil emulsion	Subcutaneous injection
AVIVAC RM		
Oil emulsion vaccine against Mycoplasma Gallisepticum infection	Active components: Inactivated Mycoplasma gallisepticum cells in water-in-oil emulsion	Subcutaneous injection
AVIVAC PM		
Oil emulsion adjuvanted vaccines against Pasterella Multocida infection	Active components: Cells and surface antigens of Pasterella Multocida cells in water-in-oil emulsion	Subcutaneous injection
AVIVAC SALMOVAC		
Oil emulsion adjuvanted vaccines against Salmonella Enteritidis infection	Active components: Cells and surface antigens of Salmonella Enteritidis cells in water-in-oil emulsion	Subcutaneous injection
AVIVAC COLIVAC		
Oil emulsion adjuvanted vaccines against E. Coli infection	Active components: Cells and surface antigens of E. Coli cells in water-in-oil emulsion	Subcutaneous injection
AVIVAC ADENO		
Oil emulsion vaccine against adenovirus inclusion body Hepatitis-Hydropericarditis	Active components: Inactivated adenovirus inclusion body Hepatitis-Hydropericarditi strain ADV in water-in-oil emulsion	Subcutaneous injection
AVIVAC PNEUMO		
Oil emulsion vaccine against Metapneumovirus infection	Active components: Inactivated Metapneumovirus (production strain subtype B) in water-in-oil emulsion	Subcutaneous or intramuscular injection
AVIVAC ND-START		
Oil emulsion vaccine against Newcastle Disease	Active components: Inactivated Newcastle disease virus (strain La-Sota) in water-in-oil emulsion	Subcutaneous injection for 1–10 days chickens

* Polyvalent combinations are also available. ** The optimum time and method of administration and revaccination depends upon the local situation. Therefore the advice of a veterinarian should be sought. Please find more detailed information in the Directions for Use.



Diagnostic AVIVAC'S kits

ELISA-kit for detection of antibodies to Avian Encephalomyelitis
ELISA-kit for detection of antibodies to Leucosis virus infections
ELISA-kit for detection of antibodies to Infectious Bronchitis virus
ELISA-kit for detection of antibodies to Infectious Bursal Disease virus
ELISA-kit for detection of antibodies to Newcastle Disease virus
ELISA-kit for detection of antibodies to Avian reovirus
ELISA-kit for detection of antibodies to Mycoplasma Gallicepticum
ELISA-kit for detection of antibodies to Mycoplasma Synoviae
ELISA-kit for detection of antibodies to Avian Influenza A virus infections
ELISA-kit for detection of antibodies to drop in Egg Drop Syndrome (EDS-76) virus
Kit for detection of respiratory mycoplasmosis by Agglutination test



AVIVAC Ltd.

- production of high-quality live and inactivated vaccines for poultry
- research and development of new products
- improvement of currently produced vaccines and methods for their control
- development and production of diagnostic test-systems using polymerase chain reaction (PCR) and ELISA
- optimization of treatment schemes and prevention, taking into account epizootic situation at the farm



NOTES

NOTES



AVIVAC Ltd.



**Modern scientific researches
and advanced technology
is a guarantee of your poultry health**



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