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ETIOLOGY, PATHOGENESIS AND PROPHYLAXIS OF BURCELLOSIS IN FARM ANIMALS
(Based on literature review)

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Annotation. This work discusses the disease brucellosis in farm animals, its origin, clinical symptoms, transmission routes and preventive measures. Brucellosis is a zoonotic infection caused by the bacterium Brucella, which is characterized by abortion, endometritis, infertility and reduced productivity in animals. It can also be transmitted to humans and poses a health risk.

Ключевые слова:
Бруцелла, зоонозное заболевание, аборт, источник инфекции, передача болезни, эпизоотология, клинические признаки, диагностика, серологическое тестирование, аллергическое тестирование, профилактика, карантин, дезинфекция, вакцина

Аннотация. В данной работе рассматривается бруцеллез сельскохозяйственных животных, его происхождение, клинические симптомы, пути передачи и меры профилактики. Бруцеллез – зоонозная инфекция, вызываемая бактерией Brucella, которая характеризуется абортами, эндометритом, бесплодием и снижением продуктивности животных.

Kalit so'zlar:
Brusella, zoonotik kasallik, abort, infektsiya manbai, kasallik tarqalishi, epizootiyologiya, klinik belgilar, tashxis, serologik tekshiruv, allergik test, oldini olish, karantin, dezinfeksiya, emlash

Annotatsiya. Ushbu ishda qishloq xo‘jaligi hayvonlarida uchraydigan brutsellyoz kasalligi, uning kelib chiqishi, klinik belgilari, tarqalish yo‘llari va oldini olish choralari yoritilgan. Brutsellyoz – Brucella bakteriyasi chaqiradigan zoonoz infeksiya bo‘lib, hayvonlarda abort, endometrit, qisirlik va mahsuldorlikning pasayishi bilan kechadi.

Relevance of the topic. When brucellosis is detected in pedigree cattle on a farm, firstly, mass abortions (miscarriages) are observed in breeding cows, milk

production from cows decreases sharply, secondly, breeding work on the farm is disrupted, calf production decreases, and thirdly, a huge amount of money has to be spent on quarantine and farm sanitation measures. The main thing is that brucellosis is transmitted from animals to humans, and the economic damage it causes is not measured in soums, it becomes a huge social problem.

Brucellosis is a zoonotic disease caused by intracellular α-proteobacteria of the genus Brucella. These bacteria can infect a wide range of domestic and wild animals, but the species B. melitensis and B. abortus are of veterinary and public health importance, causing brucellosis in small ruminants and cattle. Sheep, goats, cattle, and camels are the main sources of brucellosis infection in humans. In some regions of the world, swine brucellosis caused by B. suis is also an important zoonotic infection.

Goals and objectives. To study the origin and course of brucellosis in farm animals, special prophylactic agents used against animal brucellosis, types of vaccines, their use in animals, positive and negative aspects of vaccines, and their introduction based on a literature analysis.

All farm animals are susceptible to brucellosis. Cattle, buffalo, camels and horses are susceptible to br. abortus; sheep and goats to br. melitensis; pigs and deer to br. suis; dogs to br. canis, and rams to br. ovis. Poultry is resistant to brucellosis, and the disease cannot be caused even in experiments. It has been proven that br. melitensis can be transmitted from sheep to cattle and pigs, and br. suis to sheep and goats. Brucellosis occurs epizootically in cattle, sheep, goats, pigs, and reindeer, and sporadically in horses, dogs, and other animals. The source of the disease is sick animals, especially when clinical signs are present or when the fetus is aborted, and their amniotic fluid, fetuses, mucous secretions from the genitals, milk, urine, feces, and bull semen. The causative agent of brucellosis is stored in the udder of a cow for 7-9 years, in the udder of a sheep for 3 years and is constantly excreted with milk. After a cow aborts (abortion), a large number of brucellae are excreted from the genitals for 15-30 days. Failure to disinfect the aborted fetus in a timely manner is extremely dangerous. The disease is very rarely transmitted in pasture conditions. It mainly occurs when cattle are kept in one place. The factors of transmission of the pathogen are sick animals, their milk, feces, feed contaminated with mucous secretions from the genitals, water, pasture, bedding, and equipment used in animal care (shovels, horns, brooms, etc.). Routes of infection - young animals are infected through the alimentary route, and adults are infected through the alimentary route and during contact (sexual) contact through mucous membranes and skin. Under natural conditions, brucella is transmitted to a healthy organism through the alimentary route, through water and feces, through the mucous membranes of the eyes, nose, mouth, and genitals. In most cases, brucellosis is spread through drinking water sources. Bulls and rams infected with brucellosis play a key role in the transmission and spread of the disease. The disease can also be spread through animals purchased from healthy farms without being tested for brucellosis. Rams and heifers are considered the most dangerous, since the disease often runs a latent course in them. Dairy plants can also

become a source of disease spread when dairy products are not pasteurized to the required level. Brucellosis is transmitted when a sick animal is brought to the farm, when quarantine conditions are violated, when sick and healthy animals are kept together on pasture, when watering from the same place, or through dogs and rodents. Typically, in a new epizootic outbreak, 60% or more animals can become infected within a few months. In the herd, first 1-2 animals are born, then mass abortions are observed. If new healthy cattle are brought to such a farm after 2-3 years, first brucellosis is observed in those cattle, and then an exacerbation of the disease is observed in the cattle on this farm. Regrouping animals leads to the emergence of a new focus. Wild animals, rodents, and insects also play a major role in the spread of the disease. They have been proven to be carriers of Brucella in nature. Brucella also migrates between animal species quite strongly, moving from one species to another.

This is especially true when the natural resistance of cattle decreases or new biovariants of the pathogen appear. Poor feed, non-compliance with zoohygienic requirements, failure to promptly remove aborted fetuses, untimely disinfection, large numbers of cattle in a small area, untimely cleaning of manure and other factors reduce overall resistance and lead to the development of the disease.

Clinical signs. In humans, brucellosis is called Malta fever, Banga's disease, and black fever. The latent period of the disease can last from 2-4 weeks to 1 year, and sometimes it can be completely asymptomatic. The main symptoms are prolonged fever, deterioration of the general condition, rapid fatigue, and anemia. Later, approximately 6-8 months later, weakness, severe sweating, weight loss, and enlargement of the spleen and lymph nodes are detected. Often, a sick person develops symptoms of angina with vesicular stomatitis, and a foul odor is noticeable when applied to the mouth. Then, nosebleeds, bloody diarrhea, pain in various parts of the body, swelling of the joints, inflammation of the tendons, symptoms of spondylitis and orchitis appear. In humans, brucellosis must be differentiated from pertussis, tuberculosis, and mange. A characteristic sign of brucellosis is miscarriage and placenta retention in the second half of pregnancy in large and small horned animals. If there are no brucellated cattle in the herd, the disease proceeds unnoticed. latently. The latent period can last from 2-4 weeks to 1 year. In such animals, the disease can only be detected by serological or allergic tests. 1-2 days before the abortion, the animals' throat tightens, the external genitalia swell, and a reddish mucous fluid flows from the vagina. After abortion, the fetus is retained, followed by purulent, then purulent-fibrinous endometritis and metritis. In some animals, mastitis develops and the body temperature rises. Due to damage to the genitals, animals become infertile. In the acute stage of the disease, serous bursitis, hygroma, arthritis, tendovaginitis, orchitis, bursitis, and in male animals, orchitis and epididymitis may occur.

Measures to prevent brucellosis should be carried out in accordance with the “Measures to combat animal brucellosis” established by the Veterinary Legislation of the Republic of Uzbekistan. In accordance with this requirement, the implementation

of veterinary and organizational measures to prevent and eliminate brucellosis includes the following:

- Conducting explanatory work among the population on the prevention of brucellosis and personal hygiene rules by veterinary and medical specialists;
- keeping animals from other farms and settlements in quarantine for 30 days and then introducing them, and not allowing animals to be moved from one place to another on the farm without the permission of a veterinarian;
- keeping new animals brought to the farm in quarantine for 30 days, during which time they are tested for brucellosis using a serological method, if the tested animals have a negative result, they are added to the general herd, if the result is positive, they are re-tested and found to have brucellosis, all animals in the group are slaughtered;
-transfer cows that tested negative to a brucellosis-free farm in the same district with the permission of the regional Veterinary Department;
- compliance with veterinary and zootechnical rules in the feeding, care and use of animals, and the implementation of comprehensive preventive measures at a high level to increase the natural resistance of animals;
- do not allow unauthorized persons to enter the territory of the livestock farm;
- do not allow healthy animals to be watered and fed together with livestock that are sick with brucellosis;
- It is necessary to conduct examinations, diagnostic tests and timely vaccination of animals on the farm (settlement).

Several vaccines currently used in our country and around the world

№	Vaksina nomi	Afzalliklari	Kamchiliklari	Izoh
S-vaksinalar				
1.	B.melitensis Rev-1	· qarshi kurash/sog‘lomlashtirish dasturlarida tasdiqlangan samaradorlik (Fransiya, Italiya, Ispaniya); · B.melitensis va B.ovisga qarshi samaradorlik; · erkak va yosh hayvonlar uchun xavfsiz; · bir dozasi umr bo‘yi himoya qilish uchun yetarli; · biologik sifat nazorati mavjud (XEB (OIE) protokoli).	· yuqori abort · serologik testlar (RBT, KBR), bilvosita va raqobatbardosh IFT, polarizatsion fl uoressent tahlillar va S-LPS asosidagi boshqa testlar natijalariga interferensiya; · odamlar uchun past virulentlik; streptomitsinga chidamlilik.	· bo‘g‘oz hayvonlarni kon’yunktival emlashdan qochish orqali xavf kamayadi · yosh hayvonlarda kon’yunktival emlash yordamida serologik test natijalariga interferensiya kamayadi. · odamlar kasallanganda serologik tekshirish orqali aniqlash mumkin; bunda streptomitsinni davolash sxemalariga kiritmaslik kerak.
2.	B.abortus S19	· qarshi kurash/sog‘lomlashtirish dasturlarida tasdiqlangan samaradorlik (YEI davlatlari, AQSH va Avstraliya);	· qo‘llash dozasi va usuliga qarab, bo‘g‘oz qoramollarda abortga olib kelishi mumkin; · buqalarda teri ostiga yuborilganda xavfsiz emas (konyunktiv yo‘lning xavfsizligi noma’lum);	· yosh hayvonlarda (ayniqsa kon’yunktival usulda) kamaytirilgan dozalarni qo‘llash bilan serologik test natijalariga interferensiya kamayadi.

		· qoramollarni B.abortus va B.melitensis qo‘zg‘atuvchilaridan himoya; · bir dozasi umr bo‘yi himoya qilish uchun yetarli; biologik sifat nazorati mavjud (XEB (OIE) protokoli).	· serologik testlar (RBT, KBR), bilvosita va raqobatbardosh IFT, polarizatsion fl uoressent tahlillari va S-LPS asosidagi testlar natijalariga interferensiya; · odamlar uchun past virulentlik.	· odamlar kasallanganda standart serologik tekshirish orqali aniqlash mumkin; bunda davoalashga standart antibiotiklar kiritilishi kerak.
R-vaksinalar				
3.	B.abortus RB51	· klassik serologik testlar (RBT, KBR) natijalariga interferensiya (xalaqit) bermaslik	· bo‘g‘oz qoramollar (abort) va buqalarda foydalanish tavsiya etilmaydi; · himoya immunitetini yaratish nuqtai nazaridan S19 vaksinadan kam samarali (samaradorlik yoki revaksinatsiya bo‘yicha ma’lumot yo‘q); · himoya radiusi noma’lum; · qoramollarni B.melitensis qo‘zg‘atuvchisidan himoya qilishi noma’lum; · bilvosita va raqobatbardosh IFT serologik testlari va polyarizatsion fl uoressent tahlillari bilan interferensiya; · Odamlar uchun past virulentli; rifampitsinga chidamli.	· kasallikni tugatish uchun samarali ekanligi isbotlanmagan · odamlarda kasallikni tashxislash uchun mos keladigan serologik diagnostika testlari yo‘q; davolash sxemasiga rifampitsin kirmasligi kerak.

According to literature data, experiments have shown that Brucella cultures in soil, manure, or their mixtures at a depth of 4.5 to 22.5 cm retain their viability for 70-80 days of observation. Regular disinfection of livestock buildings in unhealthy farms is carried out immediately when clinical signs of brucellosis (abortion) are present and when positive indicators are detected in animals during laboratory blood tests. After the animals that have tested positive are slaughtered and destroyed, the entire livestock facility, including the area where the animal that tested positive was kept, is disinfected. To prevent the spread of brucellosis and quickly eliminate it, measures are taken to neutralize and eliminate the pathogen in the external environment (buildings, manure) on the farm. To do this, first of all, the cleaning areas should be moistened with disinfectants. Current disinfection uses non-toxic and non-pungent disinfectants. These include chlorine preparations, of which a chloramine solution containing 1-2% active chlorine can be recommended. The use of heating, which significantly increases the effect of the drug and allows you to reduce the concentration of the solution (to 0.5-1% active chlorine), gives better results. A 5% hot solution of lysoform, which has a less pungent odor than phenol preparations (phenol, creolin, lysol), can be recommended. In addition, one of the following disinfectants can be used: solutions containing 2.0-2.5% active chlorine, a 4% hot solution of caustic soda, a 3% hot solution of a soap-carbolic mixture, a mixture of 5

parts soap, 3 parts carbolic acid and 100 parts water, a 10-20% slaked lime solution. After disinfection, it is recommended to whitewash the premises with lime.

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