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FORMATION OF EPISOPOLOGICAL (EPIDEMIOLOGICAL) UNITS IN "BAYSERKE-AGRO" LLP

Abstract. The article gives a list of concepts (epizootological (epidemiological) unit, isolation), as well as the order of their formation and recording of the presence of epizootological (epidemiological) units and quantitative sampling of animals to determine the epizootic situation. The implementation of the data will improve the efficiency of veterinary interventions.

Keywords: epizootological (epidemiological) unit, livestock, herd, cattle-breeding section.

The effectiveness of veterinary activities depends largely on the technological methods of animal husbandry [1]. The currently existing forms of animal maintenance dictate the need to determine the presence of isolated groups of animals with a certain, limited range (relatively permanent or temporary), where equally (for each animal) the risk of ingestion of the causative agent is detected, with possible subsequent development of the disease.

The order of formation of the epizootological (epidemiological) unit is based on the technological methods of keeping animals;

Determination of the epizootological unit, the establishment of rules for the selection of animals from it for further research, allows you to control the epizootic situation, take measures to preserve the welfare of the herd, timely identification of sick animals and prevent further spread of infection.

In "Bayserke-Agro" LLP, in 4 cattle-breeding plots, we formed 6 epizootological units.

Proper use of the epizootological unit can be carried out in the presence of data characterizing the disease, the biological properties of the pathogen, the epidemiological features of the infection and distinctive diagnostic techniques [2, 3].

When calculating the required sample size of animals from an epizootic unit, depends on the size (population) of the epizootological unit, prevalence, and is set according to the formula below recommended by the OIE.

$$n = \frac{(1-(1-\alpha)^{1/D})(N-1/2(SeD-1)}{Se},$$

where n – sample size (Quantity of *herds* for sampling); a – reliability level (95%); D – Quantity of sickness cases (*herds* with sick animals); N – Quantity of herds; Se – sensitivity of the test system.

Data on a sample of animals can be calculated in advance and, to simplify and facilitate manipulation, be summarized in a general table from which one can easily determine the Quantity of animals required for the study in a separate epizootological unit.

Calculation of a sample of animals from EC for subsequent studies with different prevalence and different livestock.

Quantity of livestock in EU (heads)	Permissibleprevalenceofanimals,%						
	0,2	0,4	1	2	5	10	20
Less than 10	all	all	all	all	all	all	all
10	10	10	10	10	10	10	8
20	20	20	20	20	19	16	10
30	30	30	30	30	26	19	11
40	40	40	40	40	31	21	12
50	50	50	50	48	35	22	12
60	60	60	60	55	38	23	12
70	70	70	70	62	40	24	13
80	80	80	80	68	42	24	13
90	90	90	90	73	43	25	13
100	100	100	100	78	45	25	13

When sampling the studied animals, it is necessary to remember which of them are the most sensitive and susceptible to a particular infection. Thus, brucellosis often sick arthropod young mature individuals. They are target animals and if they are present in the herd, it is necessary to subject the indicated contingent to research first. If in any compound there are large and small cattle of different ages, horses, donkeys, camels and other animal species, then first of all it is necessary to investigate sexually mature heifers, heifers (pereljok), primary cows (primary flow).

All existing epizootological units should be subjected to epizootological examination for brucellosis, because, based on the definition of the disease, the characteristics of the pathogen and epizootological data, the contagiousness of brucella does not have enough severity for rapid spread in many separate groups of animals.

Thus, the use of the stated data in the practical veterinary service allowed us to focus the activities of veterinary specialists, to increase the efficiency of their work and to ensure the veterinary well-being of "Bayserke-Agro" LLP.

Results and analysis of the data. Successful implementation of veterinary activities largely depends on the technology of animal husbandry. Previously existing large farms or industrial livestock farms, often including separate farms, separated from each other by relatively large distances (3-10 km), with streamlined technological methods, which contained more than 90% of the livestock of farm animals, were disbanded. Currently, the majority of animals (up to 90%) are concentrated in private economic entities (including farmsteads).

You can observe a variety of technological methods, often there is a joint content of different types of animals.

All this has an impact on the effectiveness of veterinary services.

In addition, in our country there are various technological methods, in particular, there are features of livestock farmsteads and organized farms.

For veterinary care there is an urgent need to isolate separate, isolated groups of animals, an epizootological unit.

An important question is the question of the correct selection of animals from an epizootological unit in order to make a diagnosis and determine the well-being of a group for a particular disease.

The purpose of our research is to determine the object of activity of a veterinarian, i.e. an isolated group of animals, or an epizootological unit that will provide veterinary services, in order to preserve the well-being and prevent the occurrence and spread of a bacterial infection (for example, brucellosis).

In this case, the following tasks were assigned to the resolution:

- to define the term epizootic unit;

- to determine the order of formation of the epizootological (epidemiological) unit, which takes into account the technological methods of keeping animals in "Bayserke-Agro" LLP;

- establish the order of sampling animals from the epizootological unit for further research, in order to determine the welfare of the surveyed zoo group;

- epizootological indicators that should be used for a specific contagious disease.

The results of research on the formation and accounting of the epizootological (epidemiological) unit (group of animals) and the sampling of animals to establish the epizootic situation were carried out in accordance with the veterinary legislation of the Republic of Kazakhstan and the sanitary and veterinary regulations for combating animal diseases.

In this case, we have given the following concepts:

1) **livestock** - the total Quantity of any animals in a certain area.

2) **drove (herd)** - a group of domestic or wild animals of the same species, permanently or temporarily kept together, formed for economic use, or a population that lives in a certain range.

3) **an apiary** - a production unit of a beekeeping farm or farm containing one or several beehives with bee families.

4) **isolation (privatism)** is a separate, limited (isolated) or separate content (relatively permanent or temporary) groups of animals, populations or individuals that do not have contact (direct and indirect) with other objects (including h) alive) outside their habitat.

5) **epizootological (epidemiological) unit** is a group of animals with a specific, limited area (relatively permanent or temporary), where equally (for each animal) the risk of ingestion of the causative agent is detected, with possible subsequent development of the disease.

The basis for the formation of an epizootological (epidemiological) unit for these diseases is the **isolation** of the content (habitat, location) of individual groups of animals (or sources of infection) with the same risk of disease (threat of spread) of each individual.

An epizootological unit of **soil (anthrax, etc.) infections** is the location of the source or factors of transmission of the pathogen in those boundaries where it is possible to transmit the pathogen to susceptible animals or people (cattle cemetery, pasture plot, livestock building, and places of slaughter of an infected animal). Epizootological unit is established by administrative territories (rural district, district, etc.).

An epizootological unit for **aquatic infections** (leptospirosis, etc.) is a water environment that contains organic compounds that are a nutrient substrate for microorganisms - pathogenic for animals and humans with the presence of pathogens in them (ponds, rivers, ponds, wells, etc.) d.). Geographically, EE is determined by administrative units and natural connections between them.

Epizootological unit for **forest infections** is a territory with arachnoids, insects and birds, possible carriers of infection (tick-borne encephalomyelitis, babesiosis (piroplasmosis), etc.)

The epizootological unit in relation **to wild animals** leading a herd (brucellosis, pasteurellosis, etc.) and isolated lifestyles is a population of wild animals, among which there is circulation (preservation) of the causative agent (on the territory of distant plots of "Bayserke-Agro" LLP wolves, foxes, corsacs, jackals).

For the formation of an epizootological unit, according to its definition, it is first necessary to know the technological methods of keeping animals.

Technological methods of keeping animals are the basic basis for determining the epizootological (epidemiological) unit, since they determine the possibility of the circulation of the pathogen in a particular population of animals.

To date, the following technological methods of keeping animals that may be applicable for the formation of epizootological units can be noted on the territory of "Bayserke-Agro" LLP.

In the village, where there aremore than one to heads different species of animals (cattle, small cattle, camels, pigs, horses)in the private residence of citizens, the following flow charts take place:

- in the cold season around the clock in the yard;

- in the warm season - at night in the courtyard, in the afternoon - on pasture, disunited by animal species (rarely together).

On a pasture, animals (of a different or one type) are gathered from several farmsteads into a common herd (herd, flock), which are then returned to the yards of the owners. At the same time, there can be common cattle passes for different groups of animals and the territory of pasture areas.

Based on the above, the settlement in which there are animals and are contained according to the technology described above should be taken as one epizootological unit, since According to the Terrestrial Animal Code and its epidemiological provisions, its main characteristic is the risk of ingestion of the causative agent, with possible subsequent development of the disease, and its transfer from animal to animal.

In "Bayserke-Agro" LLP, there are groups of animals with different technology of keeping:

- in the cold season, all animals are on the livestock farm;
- in the warm season at night - within the farm, during the day on pastures allocated for them;
- year-round stall-driven content within the farm.

Animals of such farms in winter and summer contain separately, they have no contact with other groups and species of animals. Therefore, mutual contact between animals occurs only within this farm. In this connection, these economic groups of animals must be taken as an epizootic unit.

If animals are kept in organized farms with isolated groups that do not have contact (direct and indirect) with each other, with their caregivers, they should be taken as an epizootological unit.

In prosperous epizootological units, we recommended to conduct screening studies according to the formula recommended by the OIE, which provides for the control not of all the livestock of animals, but of individuals, the Quantity of which depends on the size of the groups (EU).

The size of a sample of animals from EC that is required to subject to diagnostic studies depends on the size (population) of the epizootological unit, prevalence, and is set according to the formula below recommended by the International Epizootic Bureau (OIE).

$$n = \frac{(1-(1-\alpha)^{1/D})(N-1/2(SeD-1)}{Se},$$

where n – sample size (Quantity of *herds* for sampling); a – reliability level (95%); D – Quantity of sickness cases (*herds* with sick animals); N – Quantity of herds; Se – sensitivity of the test system.

So, for example, if in one epizootological unit of "Bayserke-Agro" LLP there are an average of 269 heads of large and 3009 heads of small ruminants, then it is necessary to investigate according to the above formula and below the above calculation (table 1), respectively prevalence of 0.03%) and 3009 animals (with 0.01% of the presence of sick stock).

Table 1 – Calculation of a sample of the number of animals from EU for further research

Quantity of heads	**3 009**		Quantity of heads	**269**
Reliability of information	**95%**		Reliability of information	**95%**
Sensitivity of method	**100%**		Sensitivity of method	**100%**
Prevalence	**0,0%**		Prevalence	**0,0%**
Quantity of examined livestock	**3 009**		**Quantity of ex-d animals (n)**	**269**

$$n \cong \frac{(1-(1-\alpha)^{1/D})(N-\frac{1}{2}(SeD-1))}{Se}$$

$$n \cong \frac{(1-(1-\alpha)^{1/D})(N-\frac{1}{2}(SeD-1))}{Se}$$

In cases of greater or lesser prevalence, the Quantity of animals studied is calculated, as in the previous case, according to the above formula. In this case, two indicators change in it, namely: the Quantity of animals and the prevalence. These data can be calculated in advance and, to simplify and facilitate the manipulation, be summarized in a general table by which it is easy to determine the Quantity of animals required for the study in a separate epizootological unit (table 2).

When sampling the studied animals, it is necessary to remember which of them are the most sensitive and susceptible to a particular infection. Thus, brucellosis often sick arthropod young mature individuals. They are target animals and if they are present in the herd, it is necessary to subject the indicated contin-

Table 2 – Calculation of a sample of animals from EU for subsequent studies with different prevalence and different livestock

Quantity of livestock in EU (heads)	Permissible prevalence of animals, %						
	0,2	0,4	1	2	5	10	20
Less than 10	all	all	all	all	all	all	All
10	10	10	10	10	10	10	8
20	20	20	20	20	19	16	10
30	30	30	30	30	26	19	11
40	40	40	40	40	31	21	12
50	50	50	50	48	35	22	12
60	60	60	60	55	38	23	12
70	70	70	70	62	40	24	13
80	80	80	80	68	42	24	13
90	90	90	90	73	43	25	13
100	100	100	100	78	45	25	13

gent to research first. If in any compound there are large and small cattle of different ages, horses, donkeys, camels and other animal species, then first of all it is necessary to investigate sexually mature heifers, heifers (pereljok), primary cows (primary flow).

In FMD, only short-legged animals are susceptible, which should be subdivided by age and the target ones should be selected; for tuberculosis, cattle and camels are more susceptible to disease. Have their own characteristics and other infections.

Table 3 – Summary data on the Quantity of animals in the context of formed epizootological units (EU) of “Bayserke-Agro” LLP

Farm Name	Type and breed of animals	Quantity of animals	Quantity of EU
Central department			
Robotic farm	All cattle including	740	1 EU
	Dairy cows	411	
	Heels	23	
	Heifers	188	
	Calfs	118	
Commodity farm	All cattle including	835	1 EU
	Bulls	771	
	Cows	64	
Horse farm	Different breed horses	182	1 EU
Livestockarea«Kyrgauyldy»			
Horse farm	Different breed horses	170	1 EU
Thedistantsection "Kumtobe"			
Sheep farm	Small cattle	3019	1 EU
Thedistantsection "Kerbulak"			
Farm for the maintenance of cattle meat	Kazakh white-headed sheep	905	1 EU
	Auliekol sheep	487	
	Aberdeen – Angus	509	
	Aberdeen – Angus	237	
Sheep farm	Edilbayevskaya, Gissarskaya	2552	
Horse farm	Local breed horses	628	
Camel farm	Bactriancamel	196	

Analysis of the risk criteria for the emergence and spread of infectious animal diseases in the epizootological units (EU) of “Bayserke-Agro” LLP has established that the main reasons for the persistence of a complex epizootic situation for infectious animal diseases are the lack of EE formation, inadequate identification of animals, and the lack of equipment for livestock facilities necessary facilities and unsatisfactory conduct of veterinary and sanitary and special veterinary activities.

Consequently, in these CEs there is a risk of maintaining or even increasing the main source of infection, such as sick animals.

All the indicated epizootological characteristics of bacterial infections and technological methods of keeping animals in "Bayserke-Agro"LLP were taken into account when calculating the definition of epizootological units and the sample size in their samples for further research.

Considering the above, we in "Bayserke-Agro" LLP examined 4 cattle-breeding plots, where cattle, small cattle, horses and camels are located (table 3).

As shown in table 3, we have formed epizootological units, in particular:

1. A robotized dairy farm where cows of the Holstein-Frieze dairy productivity are located;
2. Commodity farm (TF), according to the content of cattle meat direction of productivity;
3.Horsefarm "Central Office", which contains breeding and sports horses;
4. Horsefarm "Kyrgauyldy" on the content of productive horse head;
5. The distant section "Kumtobe" with the content of fine-woolly sheep;
6. The distant part “Kerbulak”, which contains meat cattle in the direction of productivity of Kazakh breed Kazakh white-headed, Auliekol, Aberdeen-Angus, Hereford. On the same site there are 4 flocks of sheep of the Edilbaevskaya and Gissarskaya breeds, as well as camels and horses.

Thus, all animals in “Bayserke-Agro” LLP are located on 4 sites and form 6 epizootological units, i.e. separate groups with a specific, limited area (relatively permanent or temporary), where equally (for each animal) there is a risk of ingestion of the causative agent, with possible subsequent development of the disease.

All veterinary activities in “Bayserke-Agro” LLP are carried out taking into account the described epizootic units, according to the anti-epizootic plan.

Such an organization of animal husbandry technology and carrying out veterinary activities allowed to ensure the veterinary well-being of all epizootic units surrounded by epizootic disadvantages.

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«БАЙСЕРКЕ-АГРО» ЖШС ІНДЕТТАНУЛЫҚ (ЭПИДЕМИОЛОГИЯЛЫҚ) БІРЛІКТІ ҚҰРАСТЫРУ

Аннотация. Мақалада (індеттанулық (эпидемиологиялық бірлік, оқшауланған) ұғым тізімдері және де (індеттанулық (эпидемиологиялық бірлік, обособленность) бар-жоғына есеп жүргізу мен құрастыру, індеттік ахуалды анықтау үшін малдардың сандық іріктеуін анықтау келтірілген. Алынған мәліметтерді енгізу ветеринариялық шаралардың тиімділігін арттыруға мүмкіндік береді.

Түйін сөздер: (індеттанулық (эпидемиологиялық бірлік,) мал басы, табын, малшаруашылық учаскелері.

**Т. М. Досмухамбетов[1], А. А. Султанов[2], Н. П. Иванов[2],
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ФОРМИРОВАНИЯ ЭПИЗООТОЛОГИЧЕСКИХ (ЭПИДЕМИОЛОГИЧЕСКИХ) ЕДИНИЦ В ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В статье приведен перечень понятий (эпизоотологическая (эпидемиологическая) единица, обособленность), а также порядок их формирования и проведения учета наличия эпизоотологических (эпидемиологических) единиц и количественной выборки животных с целью определения эпизоотической ситуации. Внедрение полученных данных позволит повысить эффективность ветеринарных мероприятий.

Ключевые слова: эпизоотологическая (эпидемиологическая) единица, поголовье, стадо, животноводческие участки.

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