Professional paper
10.7251/AGSY1404830T

BRUCELLOSIS IN REPUBLIC OF SRPSKA AND PREVENTIVE MEASURES

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Abstract

Brucellosis is a disease that endangers peoples health and causes enormous damage to livestock farming. This is primary animals' disease, but under certain conditions can be transmitted to humans. Researches have been done in the area of Republic of Srpska (RS) through the program of preventive health measures, 'milk chart' and animals' movement control. The paper aims at establishing the number of tainted animals in order to make proposal of measures to suppress the disease. Proposal of measures refers to veterinary and zootechnical measures in order to prevent brucellosis. The results of the study show the highest presence of brucellosis in the region of Manjača and Vlašić. Main conclusions of the work show the occurence of brucellosis in the area of Republic of Srpska and advise on measures for suppressing of this disease.

Key words: *brucellosis, Republic of Srpska, control measures.*

Introduction

Brucellosis is primary animals' disease, but under certain conditions can be transmitted to humans (Radovanović, 1992). This disease is from the group of antropozoonose, caused by bacteria type Brucella (Lolin, 1991). Humans are infected through the contact with tainted animals or their products (Zaharija, 1978). Brucellosis is a disease that endangers peoples health and causes enormous damage to livestock farming (Tucikešić, 2008). From the wide range of zoonosis in our region, the most frequent ones are: Salmonelosis, Trichinellosis, Brucellosis and Echinococcosis. Brucellosis was not diagnosed with humans in the period between 1984-2004, whereas sporadic cases of detected disease, occurred with animals. Animals' brucellosis has increased since 2004, and along with increased number of tainted animals also occurred cases of infected humans. Epidemiological studies showed that the risk of transmitting brucellosis onto healthy animals and humans is connected to the local practise of breeding cattle, methods of milk processing, health awareness of population as well as climate conditions. Occurrence of brucellosis has great impact on livestock farming and whole industry of RS, because it causes severe damage. Agricultural production represents important branch of industry and basis for entering world market therefore establishing control over infectious diseases, brucellosis in the first place, is primary goal of administrative and professional service.
In order to put this into practise, it is necessary to identify number of tainted animals in this area and propose measures for prevention of this dangerous disease; which is the subject of this research.

Materials and methods

Resources used in this work were taken from Veterinary Institute of RS, “Dr Vaso Butozan”. Analysis has been done according to Action Plan for Suppressing Brucellosis, created by the Ministry of Agriculture, Forestry and Water Management of RS. Samples for diagnosis of brucellosis are grouped in three categories:

- Program of preventive health measures;
- Milk record;

- Animals' movement control.

Within the categories of preventive health measures, there are animals' blood samples delivered from the areas where the disease was discovered, and where physical and chemical analysis were conducted to establish the number of tainted animals in the period from 2004 to 2007 for the territory of the Republic of Srpska by regions: region Manjača, region Vlašić, Grmeč-Potkozarje region, the region of Posavina, the region of Semberia, Drina region, the region of Srebrenica, Sarajevo Romanija region and the region of Eastern Herzegovina.

Diagnosis of brucellosis in relation to milk record issuing, refers to cattle (dairy cows), along with diagnosing tuberculosis, leucosis and mastitis where physical and chemical analysis were conducted to establish the number of tainted animals.
Samples of animals' movement control refer to animals that are transported from one municipality to the other accompanied with health certificate issued. Programme of movement control includes all herds whose owners are involved in nomadism.

Results and discussion

Results are classified in three categories: Programme of preventive health measures, check for milk record issuing and animals movement control.

Table 1. Number of animals checked within Programme of preventive health measures

Region	PROGRAMME OF MEASURES							
	SHEEP AND GOATS				CATTLE			
	Number of checked ones	%	Number of positive ones	%	Number of checked ones	%	Number of positive ones	%
Manjača	96678	54.01	4720	4.882	573	68.13	0	0
Vlašić	39691	22.17	1195	3.011	202	24.02	0	0
Potkozarje	2287	1.278	23	1.006	66	7.848	0	0
Posavina	27785	15.52	79	0.284	0	0	0	0
Podrinje	1075	0.601	0	0	0	0	0	0
Srebrenica	0	0	0	0	0	0	0	0
Sarajevsko-romanijska	1299	0.726	3	0.231	0	0	0	0
Eastern Hercegovina	10188	5.692	23	0.226	0	0	0	0
TOTAL	179003	100	6043	9.64	841	100	0	0

According to the data in table 1., in the area of the whole RS (Semberija region excluded) and within the programme of preventive health measures, the total of checked blood samples from sheep and goats was 179 003 and 841 for blood samples from cattle. The most blood samples from sheep and goats came from the area of Manjača (96 678 or 54.01%), and the smallest number of blood samples comes from the area of Podrinje (1 075 or 0.601%). Area of Srebrenica did not deliver blood samples form sheep and goats. The largest number of samples from cattle (573, i.e. 68.13%) came from the area of Manjača, and the smallest number of samples (66, i.e. 7.848%) came from the area of Potkozarje. Areas of Posavina, Podrinje, Srebrenica, Sarajevo-Romanija and Istočna Herzegovina (Eastern Herzegovina) did not deliver cattle blood samples. Within the programme of preventive health measures, 6043 positive blood samples from sheep and goats have been discovered whereas there were no positive samples from cattle. The largest number of positive blood samples (4720, i.e. 4,882% from total number of samples checked in that region) comes from Manjača, and the smallest number of positive blood samples comes from Sarajevo-Romanija region (3 samples, i.e. 0,231% from total number of samples checked in that region). There were no positive blood samples from sheep and goats in the region of Podrinje.

Table 2. Number of dairy cattle checked for brucellosis

MLK RECORD				
CATTLE				
Region	**Number of checked ones**	**%**	**Number of positive ones**	**%**
Manjača	3550	12.49	0	0
Vlašić	4205	14.8	10	0.238
Potkozarje	10370	36.49	3	0.029
Posavina	8697	30.6	0	0
Podrinje	103	0.362	0	0
Srebrenica	61	0.215	0	0
Sarajevsko-romanijska	11	0.039	0	0
East Hercegovina	1424	5.01	0	0
TOTAL	28421	100	13	0.267

According to the data in table 2., in the area of the whole RS (region of Semberija excluded) and within the check for milk record issuing, the total of checked blood samples from cattle was 28 421. The most blood samples came from the area of Potkozarje (10 370 or 36.49%), and the smallest number of blood samples comes from the area of Sarajevo-Romanija (11 or 0.039%). The largest number of positive samples (10, i.e. 0.238% from the total number of checked samples from that region) comes from the area of Vlašić, and the smallest number of checked blood samples comes from Potkozarje (3 samples, i.e. 0.029% from total number of samples checked in that region). There were no positive blood samples from cattle in the region of Manjača, Posavina, Podrinje, Srebrenica, Sarajevo-Romanija and Istočna Herzegovina (Eastern Herzegovina).

Table 3. Number of animals checked for brucellosis within the programme of movement control

MOVEMENT CONTROL								
Region	SHEEP AND GOATS				CATTLE			
	Number of checked ones	**%**	**Number of positive ones**	**%**	**Number of checked ones**	**%**	**Number of positive ones**	**%**
Manjača	6766	31.6	50	0.739	1186	17.34	15	1.265
Vlašić	1779	8.309	6	0.337	679	9.928	0	0
Potkozarje	2163	10.1	21	0.971	2746	40.15	1	0.036
Posavina	5380	25.13	11	0.204	1187	17.36	0	0
Podrinje	690	3.223	0	0	251	3.67	0	0
Srebrenica	3738	17.46	381	10.19	169	2.471	21	12.43
Sarajevsko-romanijska	199	0.929	0	0	21	0.307	0	0
Istočna Hercegovina	696	3.251	35	5.029	600	8.773	0	0
TOTAL	21411	100	504	17.47	6839	100	37	13.73

According to the data in table 3., in the area of the whole RS (region of Semberija excluded) and within the programme of animals' movement control, the total of checked blood samples from sheep and goats was 21 411 and 6 839 from blood samples of cattle. The most blood samples came from the area of Manjača (6 766 or 31.60%), and the smallest number of blood samples comes from the area of Sarajevo-Romanija (199 or 0,929%). The largest number of positive samples from cattle (2 746, i.e. 40.15%) comes from the area of Potkozarje, and the smallest number of checked blood samples comes from the area of Sarajevo-Romanija (21

samples, i.e. 0.307%). Within the programme of measures, 504 positive blood samples from sheep and goats have been discovered and 37 positive blood samples from cattle. The largest number of positive blood samples from sheep and goat (381, i.e. 10.19% from total number of samples checked in that region) comes from region of Srebrenica, and the smallest number of positive blood samples comes from Vlašić (6 samples, i.e. 0.337% from total number of samples checked in that region). There were no positive blood samples from sheep and goats in the Sarajevo-Romanija and Podrinje region. The largest number of positive blood samples from cattle (21, i.e. 12.43% from total number of samples checked in that region) comes from region of Srebrenica, and the smallest number of positive blood samples comes from Potkozarje (1 sample, i.e. 0.036% from total number of samples checked in that region). There were no positive blood samples from cattle in the region of Vlašić, Posavina, Podrinje, Sarajevo-Romanija and Istočna Herzegovina (Eastern Herzegovina).

On the basis of data analysis related to regions in the whole RS, the following can be discussed: the majority of blood samples, from sheep and goats, checked within the programme of preventive health measures, come from the regions of Manjača and Vlašić, where sheep farming is not main industry. Other regions delivered significantly small number of samples; the largest number of cattle blood samples checked, within the programme of preventive health measures, comes from the area of Manjača. There were no positive blood samples from cattle in the region of Posavina, Podrinje, Srebrenica, Sarajevo-Romanija and Istočna Herzegovina (Eastern Herzegovina); the majority of cattle blood samples checked for milk record issuing, come from the regions of Potkozarje. Other regions delivered significantly small number of samples; the largest number of checked blood samples from sheep and goats, within the programme of movement control, comes from the area of Manjača. Other regions delivered significantly small number of samples; the largest number of cattle blood samples checked, within the programme of movement control, comes from the region of Potkozarje.

Brucellosis preventive measures

This work proposes the following: Veterinary-sanitary measures and zootechnical measures for brucellosis prevention.

Veterinary-sanitary measures

In the following period it is necessary to conduct diagnosis with all available animals in the whole area of RS and to eliminate all detected disease sources. All newly discovered and current disease sources have to undergo diagnostic inspections until all positive reagents are eliminated and kept under control. It is necessary to establish diagnostic inspection with humans in cooperation with health service along with animals' diagnostic inspection. Special attention has to be paid to the high-risk category of population (cattle-breeders, veterinary staff and butchers). After detection of positive cases and new disease sources, it is necessary to conduct diagnostic inspection with animals in the wider area to establish disease spreading level. Animals' movement control is essential in general, and especially in the areas marked as high-risk (Manjača, Vlašić).

Zootechnical measures for brucellosis prevention

In the following period, it is necessary to work on supplying food and shelter for sheep in the winter along with buying up of excessive sheep. It would result in keeping the herds in the areas they start nomadic activities from and reducing their movement. When supplying food for winter is in question, bulky food should be provided first (hay) and then some alternative food should be provided in the future (silage). Buying of bulky food can be organized through producers association and help from municipalities. Wheat based food should be provided apart from bulky food.

Regardless the fact that 'Pramenka' is resistant type of sheep, it is necessary to provide them

with shelter for protection during winter and low temperatures. Areas of Vlašić and Manjača do not have enough shelters for sheep. It refers to the farmers who breed large sheep herds and who did not build bigger shelters due to the lack of financial means or habits and traditions. This deficiency must be corrected in the future period through building cheap shelters from woods in the first place.

Second issue that has to be addressed is market excess that occurs in certain periods. It is important to explore possibilities of state support to farmers for solving problems of excess of animals, especially in new, changed conditions for breeding sheep. If we set the issues in this manner and offer proper solutions, then we will be solving the position of all sheep breeders in the same manner, regardless the fact whether they have chosen stationary or nomadic way of keeping and breeding sheep.

Occurrence of brucellosis and its prevention imposes the need for change of current grazing system. One of the main measures for brucellosis prevention is eliminating possibility of mixing of herds at the same pasture. Areas where sheep are kept mainly at sheep breeders' land, sheep grazing and food preparation can be organized within personal resources. The breeders whose land capacities cannot provide enough grazing and food preparation, and number of sheep in the herd is not large, it is necessary to turn to agrotechnical measures. Aiming at increase of grass yield at pastures, some synthetic fertilizers should be applied or pasture botanical composition should be improved. For all sheep breeders who have larger number of sheep in their herds, but do not have their own capacities enough for animal feed and can not provide grazing at their own land, it is necessary to provide help through allotting areas for grazing. If it is not possible to allot the land for grazing, it is necessary to offer alternative profession in order to preserve rural areas and communities.

Areas that will need support from the state regarding change of habits of cattle breeders within new circumstances are: Sarajevo-Romanija, Istočna Herzegovina (Eastern Herzegovina), Vlašić and Manjača. Organisation of pasturing should not be a big issue in the areas of: Grmeč-Potkozarje, Posavina, Semberija, Podrinje and Srebrenica. Average herd size, according to the assessment at the above named areas, does not cross adequate numbers of sheep, where the proper pasturing would not be possible to apply. Larger number of sheep and stationary breeding is typical for the area of Sarajevo-Romanija. Local authorities of agriculture association should make a plan of pasturing at their area. Municipalities of Han Pijesak and Sokolac have enough space for pasturing sheep, therefore a good plan of herd movement can prevent mixing of herds. Area of Romanija, especially in the municipalities of Han Pijesak and Sokolac, where the size and number of herds are larger, can become a problem in the effort of providing proper pasturing, but with good plan of pasturing and cooperation of sheep breeders, this problem can be resolved. The most critical areas for introducing planned pasturing are areas of Vlašić, Manjača and Istočna Herzegovina (Eastern Herzegovina). Larger herds and larger number of sheep in the field cause problem of organizing pasturing, which is typical for the areas of Vlašić and Manjača. Solving of this problem must involve municipalities and agriculture associations as well as the state. Istočna Herzegovina (Eastern Herzegovina) is rich with pastures, which makes organizing pasturing easier, but it has specific climate conditions compared to the other parts of RS. At the end of spring and at the beginning of summer, when period of drought comes, and when pastures are poor, sheep breeders go to northern parts to mountain pastures. Solving problems of sheep pasturing in Istočna Herzegovina (Eastern Herzegovina) and making plans for the same should involve municipality bodies and agriculture producers' associations.

Conclusion

The whole area of RS has animals' brucellosis registered, where the frequency of this occurrence is very different around areas. Analysis of data showed that main areas where brucellosis is present are: Vlašić and Manjača, which is logical, because these are traditionally sheep breeding areas. Other areas suffer from smaller number of cases where

disease occurred, and in some regions it has not been discovered. Taking into consideration all the facts so far, it is clear that areas for further fight against brucellosis are Vlašić and Manjača, but other regions should not be neglected. In the future period, special attention should be paid to animals' movement control in order to put the danger of disease transmission under control. Methods for protection from brucellosis should be applied also, that were elaborated in this work.

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