



Science

## **WIDESPREAD OF STRAY DOGS: METHODS FOR SOLVING THE PROBLEM IN CERTAIN REGIONS OF BOSNIA AND HERZEGOVINA**

**Muhamed Katica<sup>1</sup>, Nedzad Gradasevic<sup>2</sup>, Nejra Hadzimusic<sup>1</sup>, Zarema Obradovic<sup>3</sup>, Ramo  
Mujkanovic<sup>4</sup>, Esad Mestric<sup>5</sup>, Senad Coloman<sup>6</sup>, Muhamed Dupovac<sup>7</sup>**

<sup>1</sup> Department of Pathological Physiology of Domestic Animals, Veterinary Faculty, University of Sarajevo, Bosnia and Herzegovina

<sup>2</sup> Department of Radiobiology with Radiation Hygiene, Biophysics and Environmental Protection, Veterinary Faculty, University of Sarajevo, Bosnia and Herzegovina

<sup>3</sup> Institute for Public Health of Canton Sarajevo, Faculty for Health Studies, University of Sarajevo, Bosnia and Herzegovina

<sup>4</sup> Bosna -Vet d.o.o. Zenica, Bosnia and Herzegovina

<sup>5</sup> Veterinary station Zivinice, Bosnia and Herzegovina

<sup>6</sup> Public Institution of the Health Center, Zenica, Bosnia and Herzegovina

<sup>7</sup> GaziHusrev-beys Madrasah-Islamic High School, Sarajevo, Bosnia and Herzegovina

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### **Abstract**

Stray dogs are the ones not microchipped, which live across the streets and other public surfaces unattended, and so represent a serious public-health problem. Lack of human support for the stray dogs causes a range of problems - from territorial status to ensuring food. Such conditions force them to activate a self-preservation mechanism and return to natural behavioral patterns.

Regarding the fact that several thousands of stray dogs were recorded in observed regions of Bosnia and Herzegovina in the period from 2008 – 2009, it was obvious that such conditions could endanger the health of both humans and domestic animals. The problem in Bosnia and Herzegovina attempted to be solved using various approaches during the period from 1996 – 2009. Some solutions were: using hygiene services of public utility companies in some places, or establishing dog shelters. The third solution for the problem was the employment of hunting associations and their active participation for reducing the number of stray dogs. Minimization of large number of stray dogs required number of measures and activities such as applicable legal framework, education for dog owners, neutering of dogs, building shelters, euthanasia of ill and aggressive dogs and permanent hosting of dogs.

**Keywords:** Stray Dogs; Shelters for Stray Dogs; Hygienist Service; Euthanized Stray Dogs, Hunting Clubs.

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## 1. Introduction

After being abandoned by their owners, dogs previously accustomed to special and very acceptable living conditions, found themselves in a very confusing situation.

As already stated, stray dogs are the ones lacking attention of possible owners and so they usually walk freely across streets and other public spaces with no appropriate identification tag. They can be divided into four groups (according to WHO - World Health Organization):

1st - Abandoned dogs or the ones which lost their owner; 2nd - Dogs of known owners which move freely around public places without owner supervision; 3rd - Dogs which never had any owners and were born on the streets; 4th - Wild dogs<sup>(1)</sup>. According to the indicators of one of the organizations for animal care, fertile pair of dogs and their offspring can, in optimal life conditions, during six years, give up to 67,000 puppies. The number of stray dogs is in constant increase both in urban and rural areas and represents a serious public-health problem in Bosnia and Herzegovina and the neighbouring countries of North-East Europe. There is no stray dog population in developed countries of EU.

In contrary, the growing trend of stray dog population is recorded in many countries of Africa and Asia. There were no information about stray dog population in Bangladesh, but the number of stray dogs in South-East Asia was assessed to be 37.5 million with an annual growth of 10 %<sup>(2,3)</sup>.

After the war in Bosnia and Herzegovina, many pets (dogs) lost their owners and homes and so they, as well as their descendants, had to live as stray dogs. Due to their relatively large reproductive capabilities and lack of expediency of municipal authorities, the number of stray dogs was generally increasing, just like the potential danger to human health.

Faeces, urine and hair of stray dogs can indirectly be a potential risk for the development of echinococcosis and other parasitic and bacterial diseases, in a way that they contaminate arable land; pastures; meadows and water sources<sup>(4,5,6)</sup>. Important health risks are dog bites. Everyone could be bitten by dog, but children are those usually affected by dog bites. All parts of the body can be affected by dog bites but the most common are for lower extremities. The most risky area is head and hand. Dog mouth consists of a great spectrum of more than 200 bacteria, viruses and obligatory anaerobes and the dog bites are potential risk for infections.

In urban areas stray dogs produce the noise (barking) and consequently usurp social peace, while people directly attacked by the aforementioned animals, besides the bites, experience a long term psychological trauma<sup>(7)</sup>.

The fact that stray dogs are causes of large number of infectious and parasitic diseases, some of which are particularly dangerous to humans and domestic animals, indicates the severity of the

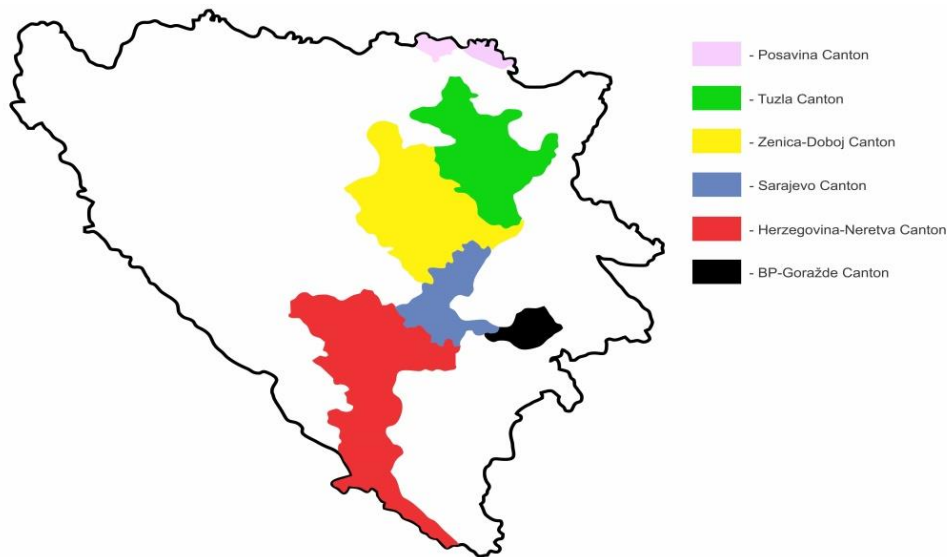
problem of their existence, especially in the circumstances of large sized population. Diseases such as rabies, echinococcosis, leptospirosis, scabies, as well as others: listeriosis, brucellosis, tetanus etc., are inevitably associated with stray dogs and therefore make sufficient grounds for the concern. In rural areas stray dogs contaminate pastures and arable land areas with their urine and faeces, but also attack livestock. In forests, due to their need for food, stray dogs destroy the forest fauna by destroying pheasants, rabbits and other animals<sup>(4,9,10,11,12)</sup>.

Average daily amount of faeces adult dogs produce depends on the quantity and quality of food consumed and their body weight, and so their weight can range from 340 up to 1000 grams. The average daily amount of urine amounts to approximately 40 ml per kilogram of body weight, what implies that dog weighing 15 kg daily produces 0.6 litres of urine<sup>(13)</sup>.

Aim of the study was to determine the prevalence of stray dogs in certain parts of Bosnia and Herzegovina, as well as to look for the best methods of their removal from public areas.

## 2. Materials and Methods

The subject of the study were stray dogs in Posavina Canton – PC (2), Tuzla Canton – TC (3), Zenica-Doboj Canton – ZDC (4), Gorazde Canton – BPK (5), Herzegovina-Neretva Canton – HNC (7), and Sarajevo Canton - SC (9) over the period from 1996 to 2009 (Figure 1.). Observed areas cover 24.4 % of Bosnia and Herzegovina’s territory with population of 1.62 million in 2008<sup>(8)</sup>.



Map 1: Cantons of Bosnia and Herzegovina observed in the study.

Direct counting method was used in the study. The method implies visually counting the individual dogs in a particular area over exactly determined time period. Even if the fact that it is impossible to count all the animals in a given area was considered, the collected data could still be used for approximate estimation of the total number of stray dogs. At the very beginning of the study, the areas were chosen and marked on the map (Map 1).

The research was carried out every day at the same time in the marked area, over the period of four days. Dogs were identified by filling tables for individual identification and also with the help of photography. Dogs were counted every day, making sure the same dogs were not counted multiple times. By summarizing the number of new dogs counted each following day, the final sum of all animals counted over the period of four days was obtained <sup>(1)</sup>.

Information from different institutions had been used in the survey (veterinary stations, cantonal veterinary inspection, hygienist services by municipalities, canine associations, non-governmental organizations for the welfare and care of animals, etc.), through which the methods for their removal from public surfaces were planned. Also, the number of captured and later euthanized stray dogs was processed, as well as the number of collected corpses over the period of fourteen years on the territory of analysed Cantons.

### 3. Results and Discussions

On the territory of the Canton Sarajevo in the period from 1996 to 2009, the population of stray dogs amounted to approximately 2000 - 3000 dogs. Over the period from 2008 to 2009 the number of stray dogs increased significantly to 4000.

Table 1: Assessed number of stray dogs and methods applied for its decrease, (average values for the period 2008/2009).

| Number of stray dogs and method used | Cantons |        |         |         |         |        |              |
|--------------------------------------|---------|--------|---------|---------|---------|--------|--------------|
|                                      | 2 (PC)  | 3 (TC) | 4 (ZDC) | 5 (BPK) | 7 (HNC) | 9 (SC) | Total        |
| Number of stray dogs                 | 0       | 4500   | 10000   | 250     | 3300    | 4000   | <b>22050</b> |
| Dog shelters                         | 1       | 1      | 0       | 0       | 0       | 1      | <b>3</b>     |
| Animal Prot. Assoc.                  | 1       | 2      | 0       | 0       | 1       | 2      | <b>6</b>     |
| Animal Cementery                     | 0       | 1      | 0       | 0       | 1       | 1      | <b>3</b>     |
| Cinology Assoc.                      | 1       | 1      | 1       | 0       | 3       | 3      | <b>9</b>     |
| Service of Hunting Clubs             | 0       | 4      | 3       | 1       | 3       | 0      | <b>11</b>    |
| Hygiene Services                     | 1       | 1      | 1       | 0       | 2       | 1      | <b>6</b>     |

The fact that stray dogs are causes of large number of infectious and parasitic diseases, some of which are particularly dangerous to humans and domestic animals, indicates the severity of the problem of their existence, especially in the circumstances of large sized population. Diseases such as rabies, echinococcosis, leptospirosis, skabies, as well as others: listeriosis, brucellosis, lajshmaniosis syndrome "larva migrans", tetanus etc., are inevitably associated with stray dogs and therefore make sufficient grounds for the concern. In rural areas stray dogs contaminate pastures and arable land areas with their urine and feces, but also attack livestock. In forests, due to their need for food, stray dogs destroy the forest fauna by destroying pheasants, rabbits and other animals <sup>(4,9,10,11,12)</sup>.

Average daily amount of faeces adult dogs produce depends on the quantity and quality of food consumed and their body weight, and so their weight can range from 340 up to 1000 grams. The average daily amount of urine amounts to approximately 40 ml per kilogram of body weight, what implies that dog weighing 15 kg daily produces 0.6 litres of urine <sup>(13)</sup>.

The results of study indicate frightening facts related to the number of dogs over the period from 2008 until 2009. In Sarajevo Canton the number of dogs was 4.000, while in Zenica - Dobo

Canton in total it was recorded to be 10000 dogs (Table 1.). These numbers have a tendency to increase even further in future.

Table 2: Comparative view of activities carried by Hygienist service in certain Cantons.

| YEAR         | EUTHANIZED STRAY DOGS (ZDC - 4) | EUTHANIZED STRAY DOGS (HNC - 7) | EUTHANIZED STRAY DOGS (SC -9) | REMOVED CORPSES (SC -9) |
|--------------|---------------------------------|---------------------------------|-------------------------------|-------------------------|
| 1996         | -                               | -                               | 3623                          | -                       |
| 1997         | -                               | -                               | 4391                          | -                       |
| 1998         | -                               | -                               | 4543                          | -                       |
| 1999         | -                               | -                               | 4571                          | -                       |
| 2000         | -                               | 747                             | 7363                          | 307                     |
| 2001         | -                               | 489                             | 7927                          | 391                     |
| 2002         | 5172                            | 604                             | 7306                          | 285                     |
| 2003         | 6393                            | 525                             | 7093                          | 227                     |
| 2004         | 6395                            | 499                             | 6922                          | 130                     |
| 2005         | 6408                            | 1339                            | 6070                          | 192                     |
| 2006         | -                               | 1070                            | 6220                          | 444                     |
| 2007         | -                               | 867                             | 6869                          | 487                     |
| 2008         | -                               | 310                             | 7217                          | 466                     |
| <b>TOTAL</b> | <b>24368</b>                    | <b>6450</b>                     | <b>80115</b>                  | <b>2929</b>             |

Analyses of Tables 1 and 2 showed that the municipal authorities in cantons solved the issue of stray dogs in a way that they caught the dogs using different methods, and later euthanizing them. This procedure was followed until April 2009, when the government adopted “Law on animals' welfare”.

The procedure of catching the stray dogs in SC was performed in a humane manner by a professional team of Hygienist services using the special cages, tossing over the net, or using the armoured rope. These services were usually provided right after the notifications of the citizens. Caught dogs were usually retained for three days in separate cages and then euthanized, unless the potential dog fosters were found. Another activity performed by Hygienist service was detection and removal of dog and cat corpses within the public spaces. 3.582 corpses were recorded and removed in Sarajevo Canton in the period from 2000 until 2009. (Table 2.). Euthanized dogs and removed corpses were harmlessly eliminated in pit graves in municipal landfills in Sarajevo.

Comparing Sarajevo and Zenica-Doboj Canton, a range of different approaches for solving the problem of stray dogs can be noticed. Great number of municipalities in ZDC have utilised services of hunting associations in order to reduce the number of stray dogs. Nevertheless, it is important to mention that the municipality of Zenica had their own Hygienist service provided, but unfortunately it was considered ineffective due to its poor organisation of services. Their ineffectiveness is explained by number of corpses not removed from public areas and inexistence

of records of euthanized dogs. The number of eliminated dogs in 2002 amounted to 5.172, which continuously increased from 10% to 20 % in each of the following year (Table 2.). However, based on obtained data, the absolute record of eliminated stray dogs was obtained in the municipality of Zenica<sup>(14)</sup>.

By analysing the activities of hygienist service in SC, it is important to outline that data in 2000. was 50.8 % higher comparing to data from 1996. The main reason for the progress was due to the modernization of equipment and increase in the number of veterinary paramedic staff. Especially high increase in number of captured and euthanized dogs has been recorded in 2001 when it reached a number of 7927, which was 7.1 % higher than in a previous year.

Nevertheless, it is important to mention a positive practice performed since 2006 by hygienist service in Sarajevo Canton, which reflects the activities of capturing dogs and transferring them for the purpose of finding them foster accommodation. This positive practice can be explained by the increased pressure of NGOs for the protection and welfare of animals on Hygienist service that favored the strategy of neutering caught dogs, and then permanently adopting them. Thus, over the period from 2006 to 2009 Hygienist service managed to accommodate 511 dogs. Since 2006, increase in the amount of removed corpses was recorded, outlining the first decade of the 2009 when the service collected record high number from public areas - 653 corpses. The significant increase in the number of corpses removed over the period from 2006 until 2009 could be explained through the significant increase in the number of dogs which had constant increasing tendency (Table 2).

Gorazde canton had no evidence of number of euthanized stray dogs, as well as about corpses removed from public areas.

Great diversity in capturing dogs and their euthanasia was evident both between cantons and between municipalities. The most used services were services of hunting clubs for euthanizing purposes. Besides cantons SC, TC (since 2010) and HNC, no canton had animal graveyard (Table 1).

In majority of the other cantons (Table 1), the corpses of stray dogs were deposited on dumping sites, what represented a great risk for the appearance of zoonosis.

The interesting case appeared in the capital of HNC – Mostar, which had two hygienic services and animal incinerator since 2005.

PC had the smallest area among cantons, with no stray dogs registered on public areas, because they transferred all abandoned dogs into dog shelter. In 2009, dog shelter was inhabited by 120 dogs (Table 1).<sup>(5,6)</sup>

A first established shelter for stray dogs in Bosnia and Herzegovina was in the capital of TC – Tuzla. It exists since 2002 and has disposed of 360 dogs. During the period in which the study was conducted, an active shelter for dogs existed in the Sarajevo (capital of SC) with a capacity for 220 dogs.

Outskirts of cities and devastated objects were favorite destinations of stray dogs. These places were ideal for breeding, since hygiene services couldn't influence and control their population. These locations were mainly inhabited by stray dogs that belong to the third and fourth group. These dogs were very aggressive and had an extremely unfriendly attitude towards humans. During the night they would move to urban areas in search for food. They always moved in a group of 15 – 20 dogs. Therefore, they represented a great danger to the inhabitants<sup>(12)</sup>.

Finally, on the 25<sup>th</sup> session of the governmental body of Bosnia and Herzegovina held on 26<sup>th</sup> of February 2009, the Act on the Protection and Welfare of Animals (Article 28, 29 and 30) was adopted. This law issues shelters for abandoned animals, activities of hygiene services and funding for shelters and hygienist services.

It has been prohibited by this law for hygiene services or hunting clubs to perform the euthanasia of dogs, except in exceptional and necessary cases.

Shelter is logical and very efficient "step" in taking care of abandoned animals, which through systematic and synchronized measures prevents further growth of stray dog population, and establishes a system of continuous control of dog health. It has been recommended that for every 800 registered dogs, shelter should provide 10 boxes in a shelter. The good establishment and successfully carried operations of the shelter were factors which played the most important role in caring for the welfare of stray dogs. Accommodation, dog's meals, as well as planned treatments or operations for dogs have to be in accordance with the principles, thus preventing any form of abuse of these animals. However, time had shown that the law was not enforceable, since most municipalities didn't have enough financial resources to establish and further finance shelter for dogs, as well as to fund hygiene services. As a result, there were number of different views on this issue. On one hand, there was a group of non-governmental organizations which worked for the welfare and protection of animals and eagerly supported the implementation of the law with strict control of euthanasia. Another group advocated the adoption of an annex to the existing law considering more radical stance with regard to the decrease in the population of stray dogs.

#### **4. Conclusions & Recommendations**

Obtained results of number of stray dogs were high having in mind surface of the area, as well as population living in observed areas. These findings could represent the potential risk for human and animal health in urban and rural areas related to continued excretion of the faeces and urine at public surfaces.

There was no unique method for removing stray dogs from public surfaces on observed territory of Bosnia and Herzegovina. Methods used in period 1996-2009 were not in accordance with basic principles of animal welfare.

The study indicated the need for further investigations related to prevalence of zoonosis often transmitted by stray dogs on human population.

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\*Corresponding author.

*E-mail address:* muhamed.katica@vfs.unsa.ba