CORRELATION BETWEEN THE CONDITION OF THE MOUTH CAVITY AND FOOD IN DIFFERENT BREED OF DOGS

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Abstract: The aim of the study was to determine the health condition of the mouth cavity in dogs associated with their feeding. In the clinic of the Faculty of Veterinary Medicine 315 dogs of different breeds were clinically and bacteriologically examined for their mouth cavity condition. Differences of the animal feeding were studied. Various stomatological diseases were registered in 268 dogs. To find it out, two groups of animals of 70 dogs in each group were formed. Group one included dogs fed on home made food, but group two was formed of the dogs fed on commercially produced dry feed. We studed microbiological spectre of mouth cavity in12 practically healthy dogs and in 61 dogs with periodontitis. It turned out that 79% of the dogs had various diseases of mouth cavity, the most popular of them was periodontitis. Stomatological diseases more often were found in those animals which were fed on home made food. Having examined the microflora in practically healthy dogs, both gram-positive and gram-negative microflora was found in equal amount.

Key words: periodontitis, micro flora, mouth cavity.

KORELIACIJA TARP ĮVAIRIŲ VEISLIŲ ŠUNŲ BURNOS ERTMĖS BŪKLĖS IR JŲ ŠĖRIMO

Santrauka. Tyrimų tikslas – nustatyti, ar šunų burnos ertmės būklė priklauso nuo to, kaip jie šeriami. Latvijos žemės ūkio universiteto Veterinarinės medicinos fakulteto klinikoje ištirta 315 įvairių veislių šunų klinikinė ir bakteriologinė burnos ertmės būklė. Atsižvelgta į šunų šėrimo skirtumus. 268 šunims diagnozuota įvairių stomatologinių sutrikimų. Jų priežastis nustatyti suformuotos dvi grupės po 70 šunų kiekvienoje. Pirmosios grupės šunys šeriti namie gamintu maistu, o antrosios grupės šunys – komerciniu būdu pagamintais sausaisiais pašarais. Ištirtas 12 praktiškai sveikų šunų ir 61 periodontitu sergančio šuns mikrobiologinis burnos ertmės spektras. Nustatyta, kad 79 % šunų sirgo įvairiomis burnos ertmės ligomis, daugiausia periodontitu. Stomatologinės ligos dažniau diagnozuotos šunims, šertiems namie gamintu maistu. Praktiškai sveikų šunų burnos ertmėje aptiktas vienodas skaičius gramteigiamų ir gramneigiamų bakterijų.

Raktažodžiai: periodontitas, mikroflora, burnos ertmė.

Introduction. According to the data published recently, about 75 % of adult dogs are affected by different dental diseases (Watson, 1994; Hoffmann, 1996), the most important of which is periodontitis (Krook, 1976; Colmery, Frost, 1986; Eisner, 1989;Watson, 1994; Johanston, 1995; Smith, 1995). Furthermore, it is believed that pathological changes in the mouth cavity are already observed in dogs which are older than five years (Colmery, Frost 1986; Gorrel, 1995; Watson, 1994; Hoffmann, Gaengler, 1996).

It is considered that dental diseases in dogs in home conditions occur mainly because of the neglect of the preventive measures of the mouth cavity, as well as insufficient diet – when animals are basically fed the food prepared by their hosts (Gorrel, 1995; Johnston, 1995; Smith, 1995).

Studies have shown that the heart, kidneys, liver, lungs and other organs can respond to the pathological changes in the mouth cavity, in particular to those of the oral microflora (Edward, 1989; Manfra, 1999). Changes of the microflora of the mouth cavity in case of different dental pathologies and their effect on other systems are being investigated intensively in Human medicine (Greager et.al., 1990; Alvares, 1997; Nieves et.al., 1997). In veterinary science serious investigations in this matter have been carried out only in the last two decades (Collins et. al., 1988; Burrows, 1994; Williams, 1994), but that sort of studies are very few in dogs.

Therefore, the aim of the work was to investigate the condition of the mouth cavity in different breeds of dogs in association with their feeding. A complex of investigations on the oral pathology have been started, especially on the possible association of periodontitis with general changes of health condition in dogs, basically illnesses of the digestive tract.

Aim of the research:

1. To investigate the incidence of dental diseases in different breeds of dogs in Latvia.
2. To investigate the possible association of dog feeding and pathology of the mouth cavity in dogs.
3. To compare the changes of the spectrum of microorganisms in the mouth cavity in clinically healthy dogs and in the ones suffering from periodontitis in different stages.

Material and methods. Mouth cavities of 315 dogs were examined clinically and bacteriologic ally at the Clinic of the Faculty of Veterinary Medicine LUA. Dogs were divided into two groups (70 animals in each group). In one of them there were dogs the owners of which had fed them on“home made” food, and in the other one – dogs on commercially produced pet food diet. Bacteriological examinations were carried out in 12

clinically healthy dogs and 61 dogs affected by periodontitis. Samples were taken by flushing mouth cavities of dogs kept starting for 12 hours. Bacteriological examinations were carried out at the Veterinary Laboratory of Jelgava district.

Results and discussion. Clinical examination results show that 79 % of dogs had some of dental diseases (Tab.1). If compared with the data published, it is by 4 % higher (Watson, 1994; Hoffmann, 1996). It could be interpreted by the fact that research in dentistry has been started quite recently in the Baltic region, as well as by people's semi-literacy in this field.

In Latvia the most freguently often diagnosed pathology of the mouth cavity in dogs was periodontitis (46 % of all affected dogs). It was especially expressed in dogs at the age of 3 to 6 years. The reason of the tendency to periodontitis in dogs of that age should be further studied.

Table 1. **Dental diseases and their prevalence in dogs of different age in Latvia**

Age group (years)	Number of the investigate dogs	The sick dogs (%)	Periodontitis		Changes of dental colour		Caries		Hypoplasia of enamel		Another dental pathology	
			n	%	n	%	n	%	n	%	n	%
0-3	219	72.6	72	32.9	45	20	9	4.1	30	13.7	60	27.4
3.1-6	63	95.2	51	81	3	48	6	9.5	-	-	18	28.6
6.1-15	33	100	24	72.8	18	55	6	18	-	-	18	54.5
Total	315	79	147	46.7	66	21	21	6.7	30	9.5	96	30.5

Figure 1. shows the association between the feeding type of dogs and prevalence of oral diseases in dogs. Thee results show evidence that different oral pathological lesions were diagnosed in those animals which were fed on "home made" food. To some extent it corresponds to the data published by other authors who stress that dogs on a hard commercial diet develop fewer problems due to the cleaning effect of the food.

However, research is being continued in this field as it is far too early to draw conclusions on scientific basis.

As to bacteriological examinations of the mouth cavity, the research shows a wide scale spectrum of oral flora: the amount of gram-positive and gram-negative bacterial flora is equal (Tab. 2).

More *Staphylococcus spp.* were found in dogs suffering from periodontitis of the 1st stage, and there was a growing tendency of gram-positive microflora.

In animals with the second stage of periodontitis, the spectrum of the oral flora was similar to that of the dogs with periodontitis of the first stage of development. However, there was a tendency of gram-positive microorganisms to decrease, while gram-negatives tended to increase.

At the third stage of periodontitis gram-positive oral flora was increased, but gram-negative flora was the same as the forms.

It should be pointed out that the results of these studies did not approve the point of view of other authors that in case of changed from gram-positive to gram-negative one (Tholen, 1990; Harvey, 1993; Gorrel, 1995).

To show the differences between the groups more clearly, the average number of diagnosed bacteria species was calculated for one sample (Fig. 2). When developing, periodontitis causes a gradual increase of the total number of oral bacterial species.

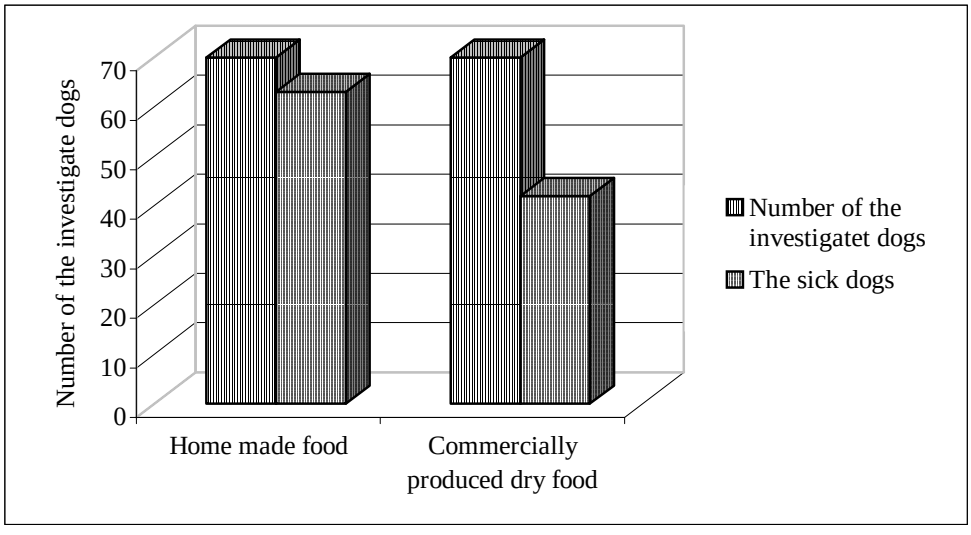

Figure 1. **Prevalence of oral diseases in dogs and the type of their feeding**

Table 2. **Spectrum of oral bacterial flora in clinically healthy dogs and in the dogs affected by periodontitis**

Genus of bacteria	Gram + Gram -	Sick with periodontitis			
		Practically healthy dogs	1. stage	2. stage	3. stage
		n=12	n=35	n=22	n=4
		Number of species in the genus of investigation example			
Staphylococcus	+	6	40	28	6
Streptococcus	+	10	22	14	4
% gram+ microflora		50	55	53	56
Pseudomonas	-	2	2		
Yersinia	-		4	2	
Edwardsiella	-	2	6	2	
Klebsiella	-	6	15	10	
Citrobacter	-	2		4	2
Proteus	-	2	10	10	4
E. coli species	-	2	6	7	
% gram- microflora		50	38	44	44
Another microorganismus			7	2	
Procent of another microorganismus			7	3	

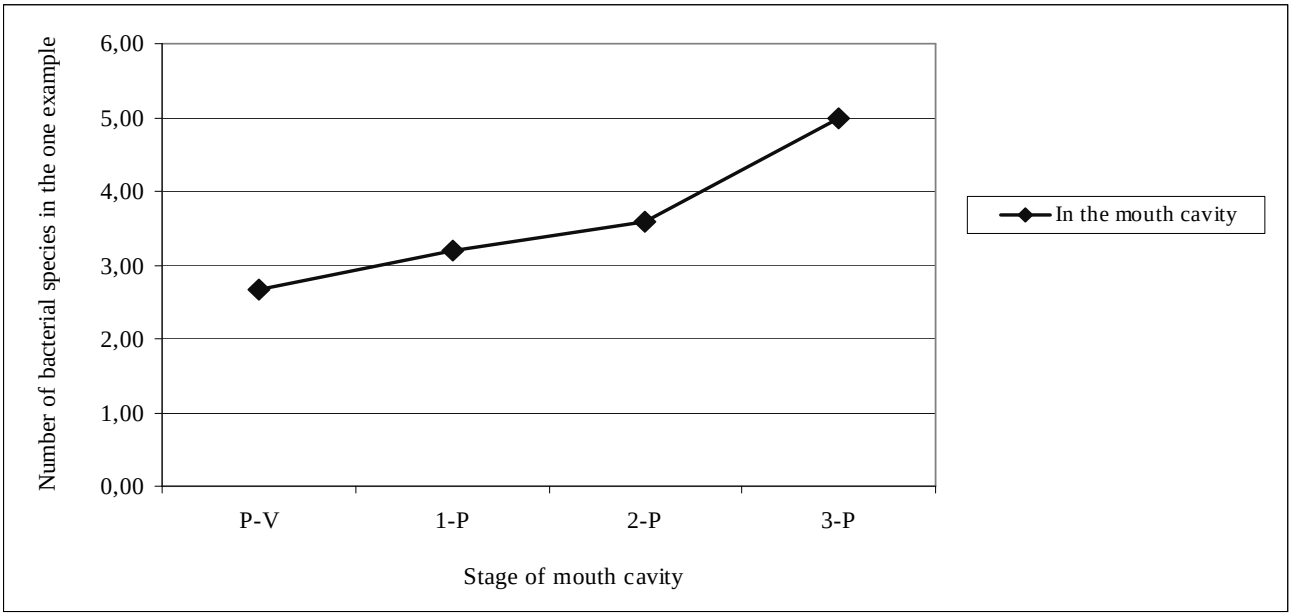

Figure 2. **The average indices of the number of bacteria species in oral samples in clinically healthy dogs and in the dogs affected with periodontitis.**

P-V – Practically healthy dogs; 1-P – 1. stage of periodontitis;
2-P – 2. stage of periodontitis; 3-P – 3. stage of periodontitis.

Bacteriological background increases radically at the third stage of the development of periodontitis.

These preliminary research results pose a lot of questions that make investigations extend. A special interest is developed in duodenum flora in case of periodontitis in the dog because it is believed that the gastric juice and digestive juices that enter the duodenum posses bactericidal effect strong enough, therefore, the duodenum must be sterile in healthy animals (Greager et. al., 1990; Hall, 1994).

A conclusion can be drawn that the dental investigations in dogs in Latvia are at the starting point that is why research should be continued in this field.

Conclusion:

1. Periodontitis occurs most often of the oral diseases in different breeds of dogs in Latvia.
2. Oral pathologies occur relatively more often in dogs which are on “home made” food then in those fed on commercially produced food.

3. In clinically healthy dogs gram-positive and gram-negative bacterial flora are approximately of the same amount.

4. When developing, periodontitis causes a gradual increase of the number of bacterial species.

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