

# ELECTROLYTE PROFILE DISTURBANCE IN CHRONIC RENAL FAILURE IN DOGS

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## **Abstract**

*The amount of water and electrolytes submitted to and processed by the kidneys on a daily basis is enormous. Consequently, it is not surprising that failure of normal renal function is associated with failure to regulate the volume and composition of the extracellular fluid.*

*The aim of the study was to assess blood electrolyte values, meaning sodium, potassium, chloride from dogs with chronic renal failure correlated with the level of chronic staging. Staging of chronic kidney disease was done in accordance with the International Renal Interest Society (IRIS) standards, based on creatinine values, determined at least twice on a stable patient with total diet.*

*After data processing, a decrease in sodium levels, increase in potassium and chloride levels was noticed in late chronic kidney disease stages.*

**Keywords:** *chronic, kidney, electrolytes, dog*

## **Introduction**

Chronic kidney disease (CKD) represents the most common form of renal disease in dogs and it is defined as continuous damage of structure or alteration of kidney function, for at least 3 months.

Sodium is a major extracellular cation that acts as an effective osmole, does not cross cell membranes readily, and can exert osmotic effects across a gradient.

Chloride is the main anion in extracellular fluid, and is the predominant anion within the body.

Potassium is the most common cation in the body. The majority of potassium resides within cells, and a small amount (2–5%) is located in the extracellular space.

Chronic renal failure staging, according with IRIS (International Renal Interest Society) is initially based on creatinine values, determined at least twice on a stable patient with total diet conditions.

Renal disease diagnosis involved continuous blood urea nitrogen and creatinine evaluation in conjunction with medical history, clinical examination, urine tests and ultrasonography investigations.

### ***Materials and methods***

The study was performed in the Faculty of Veterinary Medicine Bucharest clinic, on a number of 36 dogs, with ages from 4 to 17 years, diagnosed with chronic renal failure (CKD) according with IRIS classification. Renal disease diagnosis involved continuous blood urea nitrogen and creatinine evaluation in conjunction with medical history, clinical examination, urine tests and ultrasonography investigations.

Blood was collected from the cephalic vein on tubes without anticoagulant for biochemical analysis on an automated device for electrolyte value determination.

Electrolyte measurements included serum sodium, potassium and chloride levels.

### ***Results and discussions***

CKD staging recorded a decrease in serum sodium levels in stage III for the middle age category. For stage IV, all age categories were recorded with low sodium levels.

Serum potassium levels increased in stage IV and continued progressively towards dogs over 10 years of age.

Serum chloride levels were in normal range for stages I, II, III. In stage IV, a decrease in chloride serum levels was noted.

Table 1

#### ***Electrolytic profile (sodium, potassium, chloride) in dogs with CKD by age and staging***

<b>CKD stage</b>	<b>Age</b>	<b>Sodium</b>	<b>Potassium</b>	<b>Chloride</b>
<b>I</b>	1-5 years	156.2	5.36	119.2
	5-10 years	153.4	4.91	121.5
	>10 years	158.1	5.14	117.7
<b>II</b>	1-5 years	159.4	5.52	115.4
	5-10 years	151.3	5.22	116.0
	>10 years	149.9	4.76	110.5
<b>III</b>	1-5 years	150.0	4.54	109.3
	5-10 years	142.5	4.13	108.9

	>10 years	140.4	4.34	111.1
<b>IV</b>	1-5 years	143.8	5.92	106.4
	5-10 years	136.9	6.47	96.8
	>10 years	129.9	6.75	101.5

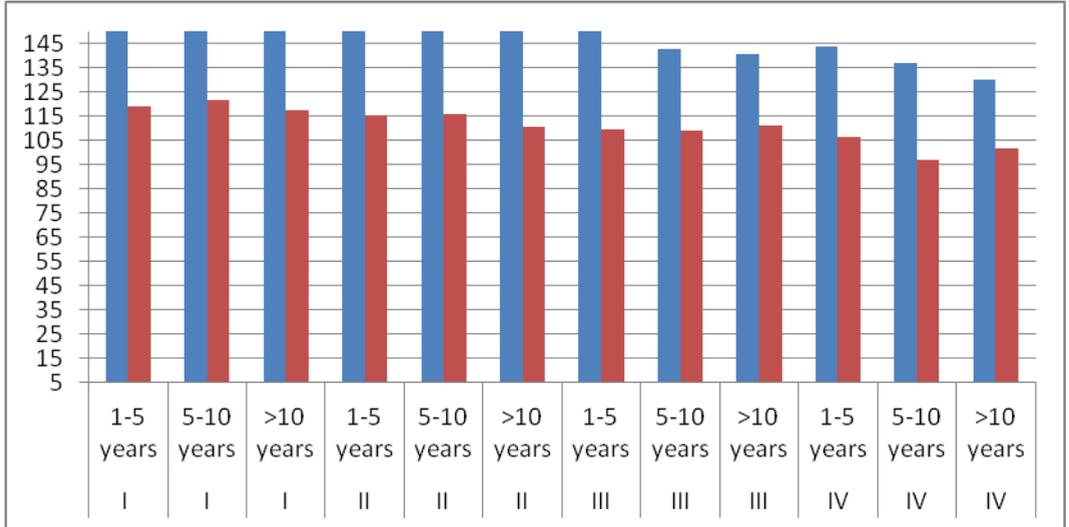


Fig. 1. Sodium and potassium serum levels in dogs with CKD by age and staging

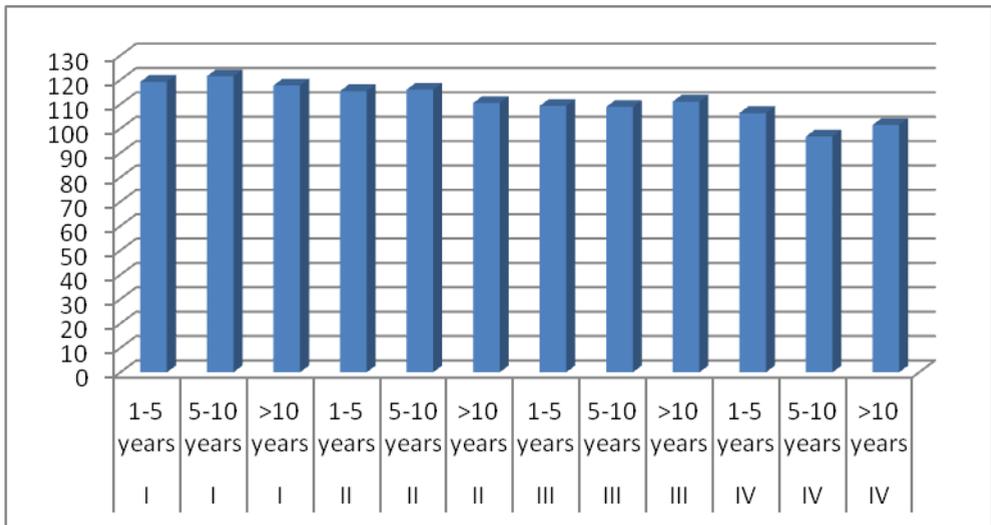


Fig. 2. Chloride serum levels in dogs with CKD by age and staging

## ***Conclusions***

1. Biochemical serum examination revealed relevant alterations of the electrolytic profile in CKD stages for dogs
2. Electrolyte profile alteration can provide useful information regarding patient's hydration status and improve patient's fluid therapy.
3. Electrolyte assessment can help establish renal disease stage as well as provide information regarding therapeutic response monitoring for improving the quality and expectancy of life.

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# RESEARCH ON MICROCLIMATE HOLDING OF SWINE INTENSIVE

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## ***Abstract***

*The research was conducted in an intensive pigs farm breeding in the county of Călărași, during two consecutive years, 2014 and 2015. The farm has a capacity of about 6.000 heads, pregnancy, maternity, youth weaned swine, swine fattening youth Phase I and Phase II compartments with microclimate monitoring system automated-computerized. Research has shown the levels of particulate matter in the air to be below the permissible current veterinary rules, demonstrating the effectiveness of automated-computerized monitoring of microclimate in swine farms.*

**Keywords:** *suspended particles, air, farm, pigs*

## ***Introduction***

Powders, as the microorganisms in the shelters' air are part of the biological factors microclimate. Particulates in the air can come from animal shelters atmospheric air as exogenous source or activity growth and exploitation of animals as a endogenous source (1, 3).

The chemical composition of dust in the air is mainly organic animal shelters. Powders from the outside are placed in shelters with the atmospheric air through the ventilation system thereof. Typically, powders from exogenous sources have particular importance for pigs, except where shelters are located in heavily polluted industrial areas, where the particulates can have toxic effects on the animals. Powders from endogenous sources may come from feed, bedding, on animal's body, mostly or lesser extent on public transport or other inventory items in shelters. Quantities of dust in animal shelters may vary depending on the species and category of animal accommodated flock size, the type of feed used in food technology, breeding and animal (with or without litter, and how, if any). Increased amounts of dust recorded in shelters with large numbers of animals (high density of animals/m<sup>2</sup>) with permanent litter, the feed is made by hand and feed volume

containing dust or feed homogenized administered by flours. Production of powders in the housing can be enhanced and the temperature rise, the rate of ventilation, as well as decreasing the relative humidity less than 75% and less than 30% of the bedding.

Standard maximum limit for particulate matter in the shelters' air for animals is 15 mg/m<sup>3</sup> air (4).

Action on animal shelters dust in the air is conditioned by the nature, quantity and composition of their site of action and animal receptivity. The most frequently affected by the dust in the air is the respiratory system of the animals from shelters (2).

### ***Materials and methods***

Air sampling was done by the SM according to EN 1233:2003 (5). The samples were taken in 4 series, each 20 samples annual of air in January, April, July and October of each year studied, from all the compartments: pregnancy, maternity, youth swine weaning youth swine fattening phase I and phase II.

The air samples were taken by aspiration from the middle compartments of the animal's head at 30-60 cm from the floor using electric pump set at a flow rate of 4 litres/minute, which were operated for 60 minutes for each sample. The pumps have been equipped with standard glass fibre filters with a pore diameter of 0.8 Whatman microns, mounted in the PVC with a diameter of 37 mm. The filters were weighed twice by the same operator and the same electronic balance to 4 decimal places, so before their installation boxes of electric pumps, as well as sampling air.

The concentration of particulate matter in the shelters' air was calculated using the formula:

$$\text{Particulate matter (mg/m}^3 \text{ air)} = C2 - C1 / \text{vol.},$$

Where:

C2 = second electronic weighing balance to 4 decimal places

C1 = first electronic weighing balance to 4 decimal places

vol. = volume of air sampled electric pump with flow rate set at 4 litres/minute.

### ***Results and discussions***

The results of the concentration of particulate matter in the shelters' air achieved in 2014 are presented in Table 1.

Table 1

***The concentration of particulate matter in the swine air shelters determined in 2014***

Compartment	Specify particulate matter concentration (mg/m <sup>3</sup> air)					
	Jan.	Apr.	Jul.	Oct.	Annual average / compartment	Limit compartment health
Gestation	2.2	2.4	2.6	2.1	<b>2.3</b>	15
Maternity	3.1	3.2	3.3	2.9	<b>3.1</b>	15
Youth swine weaned	3.3	3.6	3.7	3.2	<b>3.5</b>	15
Youth swine phase I	3.3	3.4	3.8	3.7	<b>3.6</b>	15
Youth swine phase II	4.0	4.2	4.4	4.6	<b>4.3</b>	15
Annual average / month	<b>3.2</b>	<b>3.4</b>	<b>3.6</b>	<b>3.3</b>	-	-
Annual average / holding	-	-	-	-	<b>3.4</b>	-

One that, the determined particulate matter in the shelters' air in 2014 was below the health limit of 15 mg/m<sup>3</sup> for all samples analyzed in the five compartments, with 2.1 mg/m<sup>3</sup> in gestation compartment in October and 4.6 mg/m<sup>3</sup> in July in the youth swine fattening phase II compartment.

The annual average concentration of particulate in the compartments' air had the highest value, 4.3 mg/m<sup>3</sup> air in the youth swine fattening phase II compartment and the lowest, 2.3 mg/m<sup>3</sup> air in the gestation compartment. The difference between the highest and lowest particulate matter was 46.5%.

The annual average of the monthly concentration of particulate matter in the compartments was the highest in July, 3.6 mg/m<sup>3</sup> air and the lowest in January, 3.2 mg/m<sup>3</sup> air. The difference between the maximum and the minimum concentration of particulate matter was 11.1%.

The annual average per farm was 3.4 mg/m<sup>3</sup> air, which represents 22.6% of health permissible limit, being 77.3% lower than this.

The results of the concentration of particulate matter in the shelters' air achieved in 2015 are presented in Table 2.

Table 2

*The concentration of particulate matter in the swine shelters' air determined in 2015*

Compartment	Specify particulate matter concentration (mg/m <sup>3</sup> air)					Annual average / compartment	Limit compartment health
	Jan.	Apr.	Jul.	Oct.			
Gestation	2.4	2.6	2.9	2.5	<b>2.6</b>	15	
Maternity	3.1	3.4	3.6	3.3	<b>3.4</b>	15	
Youth swine weaned	3.3	3.6	3.6	3.5	<b>3.5</b>	15	
Youth swine phase I	3.4	3.4	3.8	3.6	<b>3.6</b>	15	
Youth swine phase II	4.6	4.8	4.9	4.7	<b>4.8</b>	15	
Annual average / month	<b>3.4</b>	<b>3.6</b>	<b>3.7</b>	<b>3.5</b>	-	-	
Annual average / holding	-	-	-	-	<b>3.5</b>	-	

From analyzing the data presented in Table 2 results that the determined the particulate matter in the shelters' air in 2015 had values below the permissible health limit of 15 mg/m<sup>3</sup>, ranging from 2.4 mg/m<sup>3</sup> in the sample from pregnancy compartment in January and 4.9 mg/m<sup>3</sup> in the youth swine fattening phase II trial compartment in July.

The annual average concentration of particulate matter per compartments had the highest value, 4.8 mg/m<sup>3</sup> in the youth section swine fattening phase II and the lowest, 2.6 mg/m<sup>3</sup> in the gestation compartment. The difference between the highest and lowest concentrations of particulate matter was 45.8%.

The annual average of monthly concentration of particulate matter in the compartments was the highest in July, 3.7 mg/m<sup>3</sup> air and the lowest in October 3.3 mg/m<sup>3</sup> air. The difference between the maximum and minimum concentration of particulate matter was 10.8%.

The annual average per farm was 3.5 mg/m<sup>3</sup> air, which represents 23.3% of the permissible health limit, being 76.7% lower than this.

Comparative analysis of the concentration of particulate matter in the shelters' air for pigs was determined on samples taken in 2014 to 2015.

Benchmark concentration of particulate matter in the pigs shelters' air were used for the annual averages per compartment per month and per holding.

The results of the comparative analysis of the concentration of particulate matter in the pigs shelters' air are shown in Table 3.

Analyzing the data presented in Table 3 it results that the annual average concentration of particulate matter was the lowest in gestation compartment, both in 2014, 2.3 mg/m<sup>3</sup> air, and in 2015, 2.6 mg/m<sup>3</sup> air, and the highest young in the swine fattening phase II compartment, i.e. in 2014, 4.3 mg/m<sup>3</sup> air, and in 2015, 4.8 mg/m<sup>3</sup> air.

The annual average of the monthly concentration of particulate matter was determined in July, both in 2014, 3.6 mg/m<sup>3</sup> air, and in 2015, 3.7 mg/m<sup>3</sup> air.

Table 3

***The concentration of particulate matter in the pigs shelters' air determined in 2014 and 2015***

Compartment	Specify particulate matter concentration (mg/m <sup>3</sup> air)						
	Jan.	Apr.	Jul.	Oct.	Annual average / compartment	Limit compartment health	
Gestation	2014	2.2	2.4	2.6	2.1	<b>2.3</b>	15
	2015	2.4	2.6	2.9	2.5	<b>2.6</b>	15
Maternity	2014	3.1	3.2	3.3	2.9	<b>3.1</b>	15
	2015	3.1	3.4	3.6	3.3	<b>3.4</b>	15
Youth swine weaned	2014	3.3	3.6	3.7	3.2	<b>3.5</b>	15
	2015	3.3	3.6	3.5	3.5	<b>3.5</b>	15
Youth swine phase I	2014	3.3	3.4	3.8	3.6	<b>3.6</b>	15
	2015	3.4	3.4	3.8	3.6	<b>3.6</b>	15
Youth swine phase II	2014	4.0	4.2	4.6	4.4	<b>4.3</b>	15
	2015	4.6	4.8	4.9	4.7	<b>4.8</b>	15
Annual average / month	<b>2014</b>	<b>3.2</b>	<b>3.4</b>	<b>3.6</b>	<b>3.3</b>	-	-
	<b>2015</b>	<b>3.4</b>	<b>3.6</b>	<b>3.7</b>	<b>3.5</b>	-	-
Annual average / holding	<b>2014</b>	-	-	-	-	<b>3.4</b>	-
	<b>2015</b>	-	-	-	-	<b>3.5</b>	-

The annual average holding of particulate matter concentration was lower in 2014 by 2.9% than in 2015.

***Conclusions***

1. The concentration of particulate matter in the years 2014 and 2015 in all departments, regardless of their livestock, had low values between 2.1 mg/m<sup>3</sup> air and 4.9 mg/m<sup>3</sup> air, which is between 14% and 32.7% of the 15 mg/m<sup>3</sup> air health limit permitted.

2. The lowest annual average concentration was 2.3 mg/m<sup>3</sup> and was recorded in the gestation compartment in 2014, and the highest was 4.8 mg/m<sup>3</sup> and was recorded in youth swine fattening phase II compartment in 2015, representing 15.3% and 32.7% of the permissible health limit of 15 mg/m<sup>3</sup> air.

3. The annual average concentration was the lowest (3.2 mg/m<sup>3</sup> air) in January 2014 and the highest (3.7 mg/m<sup>3</sup> air) in July 2015, which is 21.3% and 24.7% of the 15 mg/m<sup>3</sup> air health limit permitted.

4. The annual average concentration per holding was 3.4 mg/m<sup>3</sup> air in 2014 and 3.5 mg/m<sup>3</sup> air in 2015, representing 22.7% and 23.3% of 15 mg/m<sup>3</sup> air health limit permitted.

5. The difference between the annual average concentrations per month was 3.4 percentage points, while per holding was 0.6 percentage points, which means proper management of this microclimate parameter, thanks to the automated-computerized system.

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## **FOOD SAFETY AND FOODBORNE ILLNESS**

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### ***Abstract***

*The research aimed to investigate the operators in the food and hospitality industry on the food safety principles and diseases caused by contaminated food.*

*The study appeared as a necessity after various complaints filed by consumers and scandals circulated in the press on various diseases caused by food theoretically contaminated and is based on a mixed methodology: quantitative, based on interviews with managers of industrial food and hospitality doubled and variant quantitative questionnaires, based on practical data (self-checking programs and laboratory analysis – visual, physical-chemical or microbiological parameters of hygiene checks).*

*In conclusion, institutions that have implemented the HACCP risk assessment and safety of the food, its program of self-control (visual analysis, physical-chemical, microbiological or tests of sanitation) and preliminary preoperational programs regarding compliance with the hygiene and invest in staff training, can deliver safe products that do not cause illness due to ingesting contaminated food.*

***Keywords:*** *diseases caused by contaminated food, risk analysis, checks program*

### ***Introduction***

Foodborne illness imposes economic costs on society and reduces the quality of life of those falling ill (Kramer and Scott, 2004).

Foodborne diseases are caused by consuming foods or beverages contaminated by bacteria, viruses, and parasites.

In the past 25 years a number of agents have been recognized as causes of foodborne illness. Newly identified foodborne pathogens include bacteria (*Escherichia coli* O157:H7, *Listeria monocytogenes*, *Campylobacter jejuni*, and

*Yersinia enterocolitica*), parasites (*Cryptosporidium* and *Cyclospora*), and viruses (*Norwalk-like virus*). In addition, prions have been discovered as the cause of a fatal neurodegenerative condition in humans (Creutzfeldt-Jakob disease) and in animals (e.g. scrapie in sheep and bovine spongiform encephalopathy in cattle). These emerging pathogens, organisms that are new or that existed before and are being introduced into the population for the first time, represent the cause of a number of illnesses and hospitalizations each year. Many of these pathogens possess virulence qualities that may not have been observed in the past and can cause chronic illnesses. Some of these organisms have been associated with foods that were once considered to be “safe” from the threat of foodborne illness, such as products with high acidity (e.g. tomatoes, fruit juices). These organisms have forced the scientific community to reconsider the nature and extent of foodborne illness (Woteki and Kineman, 2003).

Most of the bacterial pathogens that cause foodborne diseases and eventual death are *Salmonella*, *Listeria*, *Campylobacter*, and *Escherichia coli* O157:H7, the parasites are *Giardia lamblia*, *Toxoplasma gondii*, *Trichinella spiralis* and viruses Hepatitis A.

Table 1

***Characteristics of the main pathogens: incubation period, high risk foods and resistance to environmental stress***

<b>Pathogen</b>	<b>Incubation period/illness</b>	<b>Infectious dose</b>	<b>High-risk foods for contamination</b>	<b>Resistance to environmental stress</b>
<i>Campylobacter</i> spp.	2-5 hrs/severe abdominal pain, fever, and bloody diarrhoea with nausea. Vomiting does not usually occur. Illness self-limits in about one week	≈ 100 cells	Undercook chicken. Any foods that require handling. Water.	Know to survive at low temperature (- 20°C). Grow at low oxygen levels.
<i>Clostridium perfringens</i>	8-24 hrs/nausea,	10 <sup>8</sup> cells	Meats, meat products, and	Spores are resistant to

	abdominal pain, and diarrhoea. Fever and vomiting are rare. Usually lasts 24 hrs.		gravy.	heat (100±C). Cells lose viability when frozen.
<i>Escherichia coli</i> O157:H7	3-9 days/intense abdominal pain and non-bloody diarrhoea that progresses within 2 days. Vomiting and low-grade fever can occur as well.	Less than 10 cells	Undercooked ground beef, hot dogs, raw milk, within vegetables, cheese, juice, and fruit.	Sensitive to heat but resistant to acidic conditions. Can grow in apple cider at pH of 3.6.
<i>Listeria monocytogenes</i>	1 day - 3 weeks/ may cause nausea, vomiting and abdominal pain followed by fever. Can cause meningitis, septicaemia, and encephalitis. Can also cause spontaneous abortion and stillbirth in pregnant individuals.	Fewer less than 1000 cells	Beef, pork, ready to eat foods, soft cheeses, delicatessen foods, milk, poultry, fruits and vegetables.	Has the ability to grow to refrigeration temperatures (3°C) and resistant to acid pH (4.4) and high salt concentration (10%).
<i>Salmonella</i> Typhi	7-28 days /high fever,			

<i>Salmonella, nontyphoidal</i>	headache, vomiting, and diarrhoea 6-72 hrs/nausea and vomiting followed by non-bloody diarrhoea and abdominal cramps. Illness lasts about 7 days	10000 or more cells	Raw meats, fish, poultry, eggs, milk, and dairy products.	Susceptible to heat, but resistant to both freezing and drying. Can grow at pH 4.
<i>Yersinia enterocolitica</i>	24-48 hrs/ gastroenteritis with diarrhoea, fever and abdominal pain	Unknown	Meat, oysters, fish, and roe milk.	Can grow at temperatures of 0-44°C.
<i>Giardia lamblia</i>	24 hrs/ diarrhoea, cramps, weight loss	One cyst	Water, raw foods, fruits, and vegetables.	Resistant to chlorination.
<i>Toxoplasma gondii</i>	Attacks nervous system. One cyst can cause abortion and stillbirth		Pork, lamb and beef.	61°C or higher can inactivate cysts.
<i>Trichinella spiralis</i>	Abdominal discomfort, weight loss, nervousness. Long term illness		Undercook pork.	Freezing can kill taenia cysticerci.
Hepatitis A	14-40 days / fever, nausea,	10-100 particles	Lettuce, delicatessen	Stable at cold and

abdominal  
pain, anorexia  
followed in  
several days  
by jaundice

meats, fruits,  
juices, milk,  
vegetables,  
raw seafood  
and ice cream.

temperatures  
(- 20°C) and  
low pH.

According to Woteki and Kineman (2003), microorganisms have successfully adapted to changes in food production, processing, and preservation techniques, resulting in a number of new and emerging foodborne pathogens and the reemergence of organisms that have been problematic in the past. Infectious doses vary greatly depending on the species and type of microorganism. Ingestion of only a small number of some bacteria, viruses, and parasites is required before illness occurs, with only one organism or virus particle required in some cases. Improved understanding of infectious doses would be important in improving regulatory performance standards for food products and food safety objectives for government and industry. Microorganisms have successfully adapted to changes in food production, processing, and preservation techniques, resulting in a number of new and emerging foodborne pathogens and the reemergence of organisms that have been problematic in the past. Infectious doses vary greatly depending on the species and type of microorganism. Ingestion of only a small number of some bacteria, viruses, and parasites is required before illness occurs, with only one organism or virus particle required in some cases. Improved understanding of infectious doses would be important in improving regulatory performance standards for food products and food safety objectives for government and industry.

Although most foodborne infections are short-term, chronic illnesses are associated with foodborne illnesses as well. Acute symptoms of infection can include vomiting, diarrhoea, and fever. Long-term sequelae are very difficult to link to a single infection, due to the large time gap between initial infection and the onset of symptoms of chronic illness. Chronic sequelae may occur in 2 to 3% of foodborne disease cases (Lee J., Frey J., Slonczewski J.L., Foster J.W., 1995).

A range of chronic illnesses is associated with foodborne pathogens. *Campylobacter jejuni*, *Yersinia enterocolitica*, *Shigella* sp., *Salmonella* sp., and *Klebsiella pneumoniae* have all been reported causes of rheumatoid disease. *E. coli* O157:H7 and other shiga-like toxin producing *E. coli* are a major cause of kidney failure, with infections progressing to hemolytic uremic syndrome. A number of neurological disorders can manifest from certain infections. *Campylobacter jejuni* is associated with Guillain-Barré, a syndrome that is the most common cause of neuromuscular paralysis in the world. Toxoplasmosis in young children due to the parasite *Toxoplasma gondii* can result in retardation, epilepsy, and slight hearing loss, which can appear many years after infection. Additional chronic conditions

that may be caused by foodborne pathogens and a better understanding of how such conditions manifest in infected individuals await further discovery.

In literature exists data about some Spanish researchers Soriano et al. (2002) in a study of cafeteria food production associated with Hazard Analysis Critical Control Points (HACCP) practices found that personnel require training in all aspects of food safety. Other pioneers like Key (1996) in a USA study found that one third of food handlers did not wash their hands after using the bathroom and concluded that kitchen hygiene needs to be improved.

A successful food safety system must have means to hold individual processors accountable both for producing safe product and for reducing the level of hazards in the food supply. In addition to the need for a common understanding of the appropriate roles and responsibilities in a food safety system for government, industry, and consumers and the need for practical accountability mechanisms, a risk-based food safety system requires the risk-based allocation of resources.

### *Materials and methods*

Methodology used is a combined one: qualitative and quantitative research. Quantitative based on interviews with managers of industrial food and hospitality doubled by quantitative data based on practical data (self-checking programs and laboratory analysis – visual, physical-chemical or microbiological parameters of hygiene checks).

A survey with close question was distributed to the food production managers for 10 participants. A revised questionnaire (which eliminated the need for the interview) was then constructed. The ten surveyed participants were presented with the refined questionnaire and asked to complete the modified questions only.

Participants were asked to identify themselves as owner, manager or supervisor and to classify their business into one of eight categories (hotel, restaurant, cafe, bistro, caterer and 'other' type). They also provided information on the size of business according to the number of staff (part or full time staff, and family) employed in the food operation and the number of seats of the establishment. Each manager was asked for details about the type and level of food safety training each had received.

Management's attitudes towards training of staff in food safety were investigated with a number of questions relating to: management paying for staff training, paying extra for certificated staff, and opinions on certificated staff having greater food safety knowledge. Managers were also asked if they felt they had sufficient food safety knowledge and to rate their food safety competency levels on a one to seven Likert scale (Zikmund, 1994).

Seven important aspects contributing to good food safety practices were scored on a five point scale (five being most important). Respondents were also given an opportunity to name and score an 'other' aspect of food safety. Managers

were asked to rank five possible effects that food poisoning could have on a business. Managers also provided information on their willingness to pay a larger insurance premium to cover the costs of food poisoning.

A quantitative analysis was conducted based on microbiological analysis made for selfcheck programs for products (*Listeria monocytogenes*, *Enterobacteriaceae*), water (*E. coli*, *Enterococcus intestinali*) and sanitation tests (*Total Number of Germs*, *Coliforms*, *Staphylococcus*, *Enterobacteriaceae*).

***Results and discussions***

Managers surveyed had a mean of 5 years experience in the hospitality industry.

Table 2 presents the level of importance (by enterprise category) that respondents ascribed to each of six important aspects contributing to good food safety practices. Staff with food safety knowledge ranked highest in importance while strict environmental health officers rated last.

Table 2

***Importants factors of food safety***

Aspect Number Surveyed	Case study									
	1	2	3	4	5	6	7	8	9	10
Staff with food safety training	5	5	4	5	3	5	5	5	5	5
Correct storage temperature	5	5	5	5	5	5	5	5	5	5
All PCC' s monitorized	5	5	5	5	5	5	5	5	5	5
Quality cleaning materials	5	5	2	4	4	5	5	5	5	5
Up to date clean schedule	5	5	4	5	3	5	5	5	5	5
Quality ingredients	5	5	4	5	5	5	5	5	5	5
Pre operational hygiene procedures	5	5	5	5	5	5	5	5	5	5

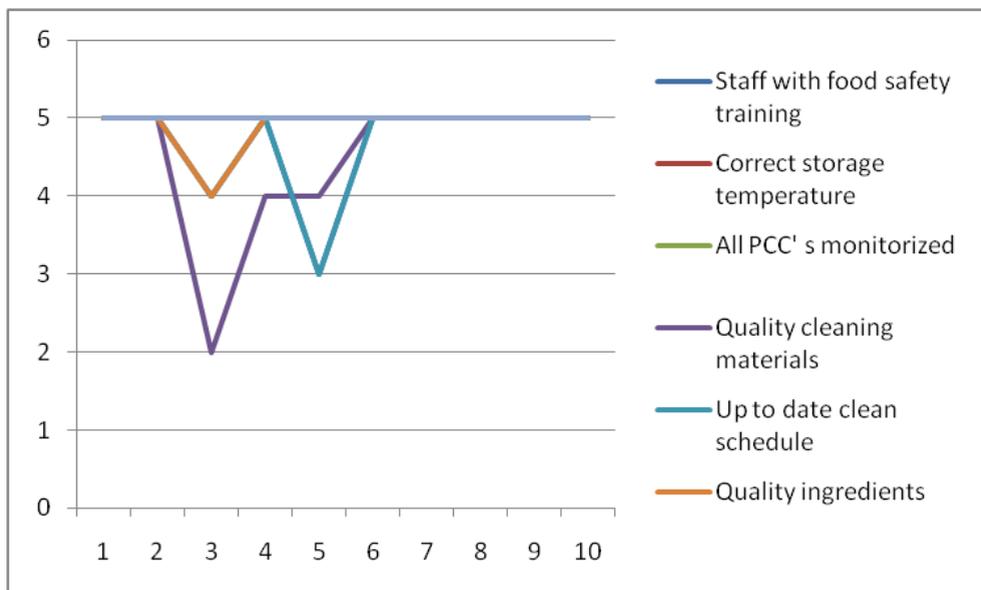


Fig. 1. Food safety aspects

Table 3 presents the microbiological aspects analyzed for each facility.

Table 3

**Microbiological analysis based on Commission Regulation (EC) No. 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs**

Microbiological Tests	Case study									
	1	2	3	4	5	6	7	8	9	10
<i>Listeria monocytogenes</i>	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent
<i>Enterobacteriaceae</i>	0	0	0	0	0	0	0	0	0	0
<i>E. coli</i>	0	0	0	0	0	0	0	0	0	0
<i>Enterococcus intestinali</i>	0	0	0	0	0	0	0	0	0	0
Total Number of Germs	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
<i>Coliforms</i>	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent
<i>Staphylococcus</i>	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent
<i>Enterobacteriaceae</i>	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent

The Food Hygiene Regulations permits licenses for food premises only with food safety standards through the implementation of a recognized HACCP program.

All the premises have implemented HACCP programs, thus there exists differences in between locations regarding food safety training for staff. Another difference makes the high turnover in the industry.

All the facilities respect correct storage temperature and all the PCC's. Some differences were found regarding quality of cleaning materials or up to date clean schedule.

All the facilities respect pre operational hygiene practices and some of them are buying with better prices, but not so qualitative ingredients.

All microbiological tests are in the legal standards, so even if there are some failures on minor aspects of food safety procedures, the food is safety for consumers.

### ***Conclusions***

If management of food establishments is to become more effective in preventing foodborne illness the proportion of staff holding recognized qualifications in food safety must be increased and the standards of food safety qualifications should be raised.

A better trained staff in HACCP procedures and hygiene policies is a priority.

Identification and correction of the reasons for the lack of knowledge about HACCP is a must for small to medium sized businesses.

Food facilities that have implemented the HACCP risk assessment and safety of the food, its program of self-control (visual analysis, physical-chemical, microbiological or tests of sanitation) and preliminary preoperational programs regarding compliance with the hygiene and invest in staff training, can deliver safe products that do not cause illness caused by eating contaminated food.

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# THE INCIDENCE OF DOG REPRODUCTIVE DISORDERS

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## ***Abstract***

*The study was conducted on a total of 22 male dogs with various genital disorders, from October 2005 through March 2016, conditions that were diagnosed and treated in the USH-FMV clinic.*

*Tumoural diseases have prevailed followed by inflammatory and infectious diseases, and treatments were surgical, medicamentary or mixed.*

*For the treatment of the tumoural diseases have been used complex treatment diagrams that included both cytotoxic substances, and hepatoprotective substances and general tonics. Surgical treatments were both conservative and complex, followed by the removal of certain anatomical parts.*

*The study aimed to determine the prevalence of certain breeds and ages for the most common diseases of genitalia in order to decrease their incidence, by removing the factors that led to their emergence.*

***Keywords:*** dog, genital disorders, inflammatory, tumours

## ***Introduction***

The study was done to demonstrate presence of heterogeneity within reproductive disorders related to breed, age and breeding regime. Clinical and laboratory examinations should be performed to include testicular areas and prostate gland and penis, regardless of age or breed.

It also needs to be given greater importance to conservative treatments (were successful in 30% of cases) and preventive (e.g. orchidectomy specimens without genetical value) orchidectomy would be better made before the start of sexual activity on a young, healthy animal, and being a routine surgery without major implications on male metabolic and/or immunological status.

## ***Materials and methods***

This study was performed in the Department of Obstetrics and Reproduction at *Spiru Haret* University on a total of 22 cases (dogs with different reproductive disorders), of which:

- ❖ 2 dogs breed Cocker Spaniel.
- ❖ 2 dogs breed German Shepherd.
- ❖ 2 dogs breed Dachshund.
- ❖ 1 dog breed Shar-Pei.
- ❖ 1 dog breed Boxer.
- ❖ 1 dog breed Poodle.
- ❖ 1 dog breed Fox Terrier.
- ❖ 1 dog breed English Setter.
- ❖ 1 dog breed Sheltie.
- ❖ 1 dog breed Samoyed.

Different diagnostic methods were used from case to case:

- ❖ clinical examination;
- ❖ ultrasound;
- ❖ haematology assay;
- ❖ antibiotics assay;
- ❖ biochemical assay.

We have selected the most representative cases, each case benefiting from observation forms.

## ***Results and discussions***

In this study carried out on 22 cases with gynaecological disorders, were found the following:

Depending on the age were reported:

- 4 cases – dogs between 1 and 3 years;
- 6 cases – dogs between 3 and 5 years;
- 12 cases – dogs over 5 years.

The incidence of genital diseases by race:

- Common breed – 8 cases;
- Cocker spaniel – 2 cases;
- German Shepherd – 2 cases;
- Dachshund – 2 cases;
- Shar-Pei – 1 case;
- Boxer – 1 case;

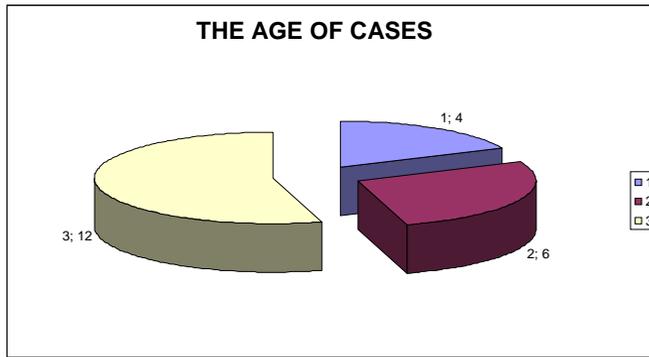


Fig. 1. *Ages of the dogs*

- Poodle – 1 case;
- Fox Terrier – 1 case;
- Setter English – 1 case;
- Sheltie – 1 case;
- Samoyed – 1 case.

Grouping diagnosed diseases was:

- dogs with severe tumour – 8 cases;
- dogs with severe congenital – 3 cases;
- dogs with venereal diseases – 3 cases;
- dogs with inflammatory diseases – 5 cases;
- dogs with surgical genital injuries – 2 cases.

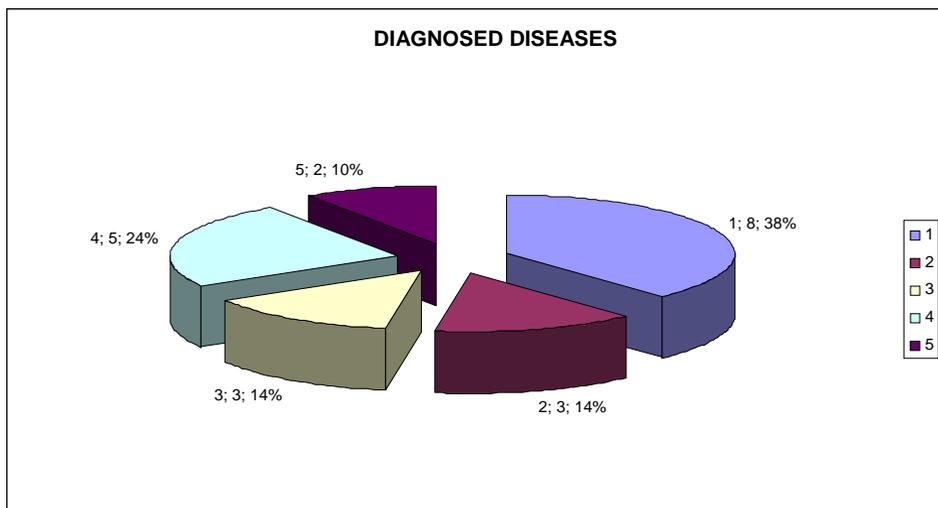


Fig. 2. *Diagnosed diseases*

Types of used treatments:

- drug treatments (6 cases);
- surgical treatments (14 cases);
- mixed types of treatment (1 case).

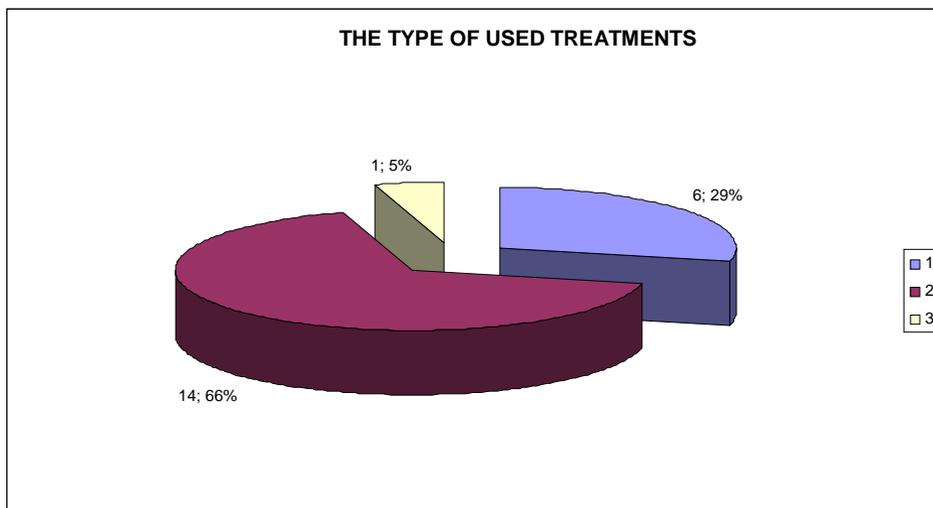


Fig. 3. *Used tratements*

## Conclusions

The study included a total of 22 dogs with various genital diseases, diseases that were diagnosed and treated in the USH-FMV Clinic. The most frequently diagnosed conditions were the type of tumour (36.36%) and the inflammatory diseases (22.72%). Somewhat morbid entities were rare type of congenital and venereal diseases (13.63%) and surgically injuries (9.09%).

1. From a therapeutic standpoint, the surgical treatment is prevalent (63.63%), medicamentary treatments and treatments being mixed at 27.27% and 4.54% of the total.

2. Most affected males in this study were shown to be common breed dogs (36.36%), the other breeds having a relative heterogeneity.

3. Orchidectomy was a salutary intervention in controlling disease or congenital tumour type.

4. The trial will be continued on a larger scale, using several diagnostic tools and therapeutic modalities.

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# CHROMATO-STRUCTURAL CHANGES CORRELATED WITH THE HEPATOPULMONARY PATHOLOGY IN DOGS. CLINICAL CASE STUDY

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## ***Abstract***

*The opportunity of approaching iridology was due to the possibility of extending the interpretation of facial expression within the hepatobiliary, cardio-respiratory, urinary or neuro-spinal cervical-thoracic disorders in dogs. In the Romanian veterinary medicine, iridology represents a new domain, the interpretation and evaluation of the results obtained based on this conventional method not having an informational comparative statistical basis, reason for which the results of the iridodiagnostic in relation to various organic disorders can be interpreted. The iridological clinical significance in human medicine finds its merit in terms of the guidance of the diagnosis. Based on this finding and not only, we consider appropriate to implement the method in veterinary medicine, possibly as experimental comparative conventional method.*

**Keywords:** *dog, chromate-structural changes, iris, pathology, hepatopulmonary*

## ***Introduction***

The reflectivity of the organism to the biochemical status change triggers nociceptive impulses to the CNS, which manifest cephalic, including at the iris' level. Some changes of the iris pigmentation are due to disorders of the tissular endocellular processes; the iris' "Fingerprinting" reflecting the remote impression of the results of the visceral, muscular, vascular, glandular or cutaneous receptor's excitation due to extracellular quantitative diffusion of the abnormal compounds. From the level of the local receptors, excitations reach the spinal cord and the thalamus, being projected on the cortex. Through spino-thalamic nerve pathways, the transmitted excitations stimulate neurons of the optical paths with the perikaryons in the lateral geniculate corpus of the metathalamus. In this way, it could be explained the connection between the affected organic area and the iris. The interrelation could motivate the representation of the organic disorder on

the iris through changes in structure or colour thereof. The nervous interdependencies validate the exploitation of the correlation between the changes in the iris and various organic disorders.

In other words, the pigmentation changes of the iris occurred during the illnesses could be explained based on the viscerο-iris connections and the neuro-vegetative dystonia, the visceral signals reaching the reticular substance through the cervical sympathetic chain and the trigemino-reticular neurons.

### ***Materials and methods***

Half-breed, 8 kg, 13 years old, male. Observation sheet no. 1001/2004. The dog, known as epileptic (Phenobarbital 3mg/kg/day), for the last 7 days, presents oscillating fever (39.5°-40.1°C), sneezing, coughing, runny nose, “hoarseness”, apathy, loss of appetite and diarrhoea. During the coughing attacks, the dog adopts a scared facies and an orthopneic position.

The proper methodology included *visualization* (iridoscopy), *photography* (irido-photography), photographic image *processing*, data *recording* in the iridiogram, *comparing* the notes of the iridiogram with the map of the iris and *interpretation* of the results.

We have examined the iris with an artisanal lenticular system able to magnify 8-10x. The light used to highlight the changes of the iris came, depending on the case, from the otoscope equipped with an ultra-flat bulb, dentistry lamp or flashlight. We have projected the light perpendicularly or at 45° in bundles of adjustable intent relative to the individual limit of endurance.

The visualization of the iris was usually followed by “irido-photography”, in order to stabilize, increase and process the image. Irido-photography can be unlimitedly analysed, while the long “online observation” of the iris can generate the animal’s discomfort. For each iris, we have performed successive photographic exposures, selecting and processing the sharp images.

Photographic processing has included “brightness or contrast techniques” in order to obtain the necessary clarity to detect the changes of the iris. We have not chromatically modified the irido-photography, thus being able to distort the iris colour imprint. The exposure and image processing was made using the programme Adobe Photoshop CS2 and Nero Photoshop Viewer, using Corel Draw as support for the artistic expression.

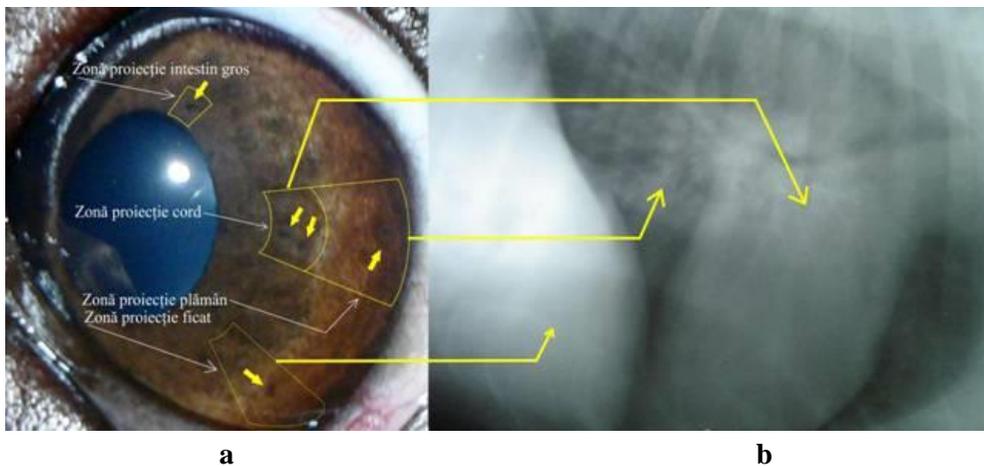
Without optical image electronic coordinator, using only the artisanal lenticular system, we acknowledge the relativity of the graphical exposure of the iris changes.

Iris’ analysis was performed sectoral, clockwise (the technique being taken from human iridology, Bondarciuc, Colton, Merte), marking in the diagram the changes in colour, shape and texture. The diagram, as a model, was taken from J. Colton.

## ***Results and discussions***

We have discovered the hyperkeratosis of the truffle and bilateral mucous-puroulent nasal secretions, hyperemia of the conjunctival mucosa and ocular mucous-puroulent secretions, blepharitis, gingival cyanosis, dilated pupils, dry mouth, congested tongue with white deposits, cheek muscles contracture, retro-mandibular sensitivity and kyphosis. The pulmonary auscultation revealed polypnea, tachycardia, tubal pathological blast and crackles depending on the pulmonary area of the auscultation. We have not perceived overlaid heart sounds; instead we have considered enlarged the area of cardiac projection. The radiogram has revealed anterior and posterior supercaudal pulmonary opacity, but with bronchial pattern present, increased cardiac mark (especially in length) and hepatomegaly (Fig. 1b). Hepatic enzyme-diagnosis and the interpretation of the ECG have excluded the hepato-cardiac insufficiency. Based on the changes in the lung parenchyma, in the bronchial manifestations (wet rales, bronchial catarrh), and the heat graph (thermal monitoring every four hours for two days), the diagnosis has been catarrhal bronchopneumonia.

Generally, the subjects diagnosed with bronchopneumonia have presented bronchial catarrh, which is why we believe that the infection was done bronchogenically, originating from the anterior aerophone pathways.



*Fig. 1. The correspondence between the pathological Iris pigmentation and the pulmonary and hepatic structural and form changes: a – pigmentations in the cardiac, pulmonary, hepatic and intestinal projection areas; b – the radiography shows bronchiolar opacity, heart increased in volume and hepatomegaly (partially visualized).*

Iridologically, we have noticed pigmentation changes (0.2 mm) located in areas of cardiopulmonary (3 am), hepatic (7 am) and intestinal (1 pm) projection (Fig. 1a). The iridscopy was performed on light brown and scratchy iris. The case was presented due to the neuro-reflex expression of the respiratory complications (hepatic and intestinal), which explains the “interdependence of the vegetative integrative processes” and of relationship (somatic) within the organism, expressed neuro-reflex sectoral at the level of the iris.

### ***Conclusions***

1. The visceral pathology was expressed neuro-reflex at the level of the iris, based on the visceral-iris connections and the neuro-vegetative dystonia, the visceral signals reaching into the reticular substance through the cervical sympathetic chain and the trigemino-reticular neurons. The hepatobiliary pathology has been represented neuro-reflex at the level of the iris through pigmentation changes located in the hepatic areas and those of the gallbladder. We have not found pigmentation changes in other areas of the iris, even if the hepatic pathology has often been accompanied by extrahepatic complications (intestinal gas accumulation and distension, ascites, renal failure, etc.).

2. The iris changes in dogs with tracheobronchitis have been characterized by depigmentation in the pulmonary and intestinal projection area in eight cases (72.7%) or only pulmonary in three cases (27.2%). Regardless of the evolutionary clinical form of the tracheobronchitis, the chromatic changes of the iris incomplete reliefs' edges from lungs reflection areas were similar.

3. The iris changes in dogs with bronchopneumonia have been characterized by point-like pigmentation comprised between 0.2 and 0.4 mm in the cardiopulmonary projection areas of all subjects. In four subjects diagnosed with bronchopneumonia, the pigmentation changes were also observed in the liver and large intestine projection areas.

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# THE DIETARY MANAGEMENT OF FELINE CKD

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## ***Abstract***

*One of the frequent diseases which causes morbidity and mortality in ageing cats is Chronic Kidney Disease (CKD). Nutritional management was focused on several objectives: ensuring energy sources (in particular by the addition of grain bran and Plantago ovata seeds), maintaining optimum values for some electrolytes and minerals (Na, K, Ca, P, and Mg), provide antioxidant, anti-inflammatory and diuretic support through natural food sources (such as beetroot or celery juice). It was balanced (weighted?), tested and monitored diet in cats with CKD while administering allopathic and nutritional supplements. Some biochemical parameters were monitored periodically, especially creatinine and urea.*

***Keywords:*** feline CKD, diet, nutritional management

## ***Introduction***

Chronic kidney disease (CKD) represents a progressive and irreversible diminishing of the kidney's functions over a long period of time and becomes clinically evident only after the loss of over two thirds of the total number of nephrons. In essence, in the case of CKD, the kidney loses its capacity of concentrating urine and recycling water. A drop in urine density, observed constantly, even after water deprivation, indicates the kidney's incapacity to efficiently use water and to concomitantly eliminate toxic metabolites. The urine will have a higher total daily volume (polyuria) and will be less concentrated, its density values being close to that of sanguine plasma (1.010). Consequently, water being eliminated in large quantities together with certain electrolytes, the water needs concomitantly increase and the exaggerated thirst sets in polydipsia. This tandem of polydipsia-polyuria symptoms is usually the first sign to appear (Howell, 2011).

The CKD diagnostic is put through the correlation of symptoms with the results from lab testing of blood and urine samples, as well as with of other methods of paraclinical diagnostic. The sanguine parameters can appear modified as follows: uremia frequently over 150-200 or even 300 mg/dl in advanced cases; sanguine creatinine constantly over the value of 3-4 mg/dl; increased values of phosphorus; hypokalemia as consequence of the loss of the kidney's ability to reintegrate potassium at sanguine level and the exaggerated secretion of the latter.

In general, the nutritional management of CKD can target: furnishing through food the necessary of energy to maintain and obtain, consecutive with the upkeep, of an adequate corporal score; amelioration of the clinical manifestations of uremia; maintenance of the acid-base equilibrium and electrolytic equilibria; slowing down the evolution of the disease (Danks, 2015). Bernachon et al. (2014) have made a study over the palatability of five nutritional supplements destined for cats with CKD, and the results highlighted the advantages of the Pronefra product.

### ***Materials and methods***

The nutritional management for the cats diagnosed with CKD consisted of the structuring of a diet that would: be palatable, ensure the daily necessary of energy, improve the values of some renal biochemical parameters and furnish the optimum intake of mineral elements, electrolytes and antioxidants.

### ***Results and discussions***

The nutritional management consisted in administering a diet that would ensure the necessary energy intake (using the relation  $\text{Kcal EM/day} = 50 \text{ Kcal} \times \text{LW kg}$ ), and maintain within normal parameters the intake of protein (approximately 140 g/day PB) and mineral elements. The reduction in the glomerular filtration rate, the incapacity of concentrating urine, the apparition of azotemia and the progression of the disease was correlated at rats, as well as cats, with a high protein content (Adams et al., 1994). Nevertheless, subsequent studies (Finco et al., 1998) have shown that caloric restriction and a moderate/normal protein intake have favourable effects on the health of CKD diagnosed cats. The retention of phosphorus as a result of the reduction in glomerular filtration leads in time to hyperparathyroidism, renal osteodystrophy and the calcification of the soft tissue, followed by rapid decease at cats diagnosed with CKD (King et al., 2007; Boyd et al., 2008). The hypo-phosphoric diet is one of the keys to increasing the rate of survival (Barber et al., 1999). Systemic hyper-tension is frequently seen at cats with CKD. Because of this, studies have shown that excess sodium can influence heart rate but, in the same way, too little sodium leads to the activation of the renin-angiotensin-aldosterone system (RAAS). Cats with CKD can become hypo-calcemic due to polyuria, which is why these diets need to contain potassium as well.

The supplement used in the food was Pronefra, to which the following diet was added. This supplement contains calcium carbonate and magnesium, chitosan, *Astragalus membranaceus* and hydrolyzed fish protein, its efficiency (prehension, total consumption, palatability) being tested in various studies (Donald, 2015).

a. Ensuring the source of protein:

– Meat/organs/yolk; the source of protein is important from the perspective of the amino acids composition; yolk has good caloric value (317 kcal/100g) and a remarkable chemical composition through the profiles of the amino acids, essential fat acids and mineral elements.

– Quinoa seeds/rye flakes/oat flakes: veritable sources of energy and essential fat acids. Quinoa seeds (Figure 1) ensure an important proportion of the ration's energetic necessary (120 Kcal/100g).



Fig. 1. *Quinoa seed*

Antioxidants have another important role in CKD diets (Keegan and Webb, 2010). The majority of studies have shown that diets containing these fat acids have led in time to the slowing of the degradation of the renal function.

b. Ensuring the source of energy, mineral elements and antioxidants:

– White beet and/or white beet juice distinguishes itself through a reduced caloric content, of only 44 kcal/100g, but in this recipe we capitalize on its antioxidant, anti-inflammatory and detoxifying effects. Oxidative damage plays an important role in progression of renal disease (Keegan and Webb, 2010). The chemical composition distinguishes itself as well through a high content of betalain pigments and mineral elements.

c. Sources of nutritive substances with effect in the therapy of CKD:

– The seeds of *Plantago ovata* (Figure 2), commercially known under the name of *Psyllium*, have, besides the digestive effect, an incontestable role in regulating the intestinal transit and other remarkable effects from nutritional and medical stand point: they contain bio-cative metabolites – phenols, sterols, alkaloids, iridoids.



Fig. 2. *Plantago ovata* – plant and seed

These have been added to the diet for the anti-inflammatory effects (due to acetozydes) and resistance to fermentation. The anti-bacterial effect is due to the plantamaiozides in their composition.

A three day diet, for cats with CKD, can be formulated from: one yolk, 200g meat, 100g quinoa seeds and 100g white beet which have a caloric intake of approx. 250-300 kcal/day.

Besides the previously mentioned diet, increasing the palatability of the food and a very good hydration were also pursued in the nutritional management.

### ***Conclusions***

Nutritional management and dietary modifications are the most important keys to slowing the progression of renal disease.

The diet must provide sufficient energy to maintain a good condition of the CKD diagnosed patient, by ensuring a caloric restriction and not a protein restriction, monitoring the phosphorus content, ensuring balanced mineral sources and important sources of antioxidants and anti-inflammatory substances.

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## DENTAL ABSCESS IN DOG

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### ***Abstract***

*The aim of the study is highlighting the trends of evolution from early stages of dental diseases and severity of this pathology in advanced stages in dog as a result consequence of a poor prophylactic education and late diagnosis.*

*Because of physiology and anatomy of oral cavity in dog, dental abscesses occupy second place in dental pathology of this species after periodontal disease, in most cases as a direct consequence of it and are often diagnosed late due to missing or not applying protocols of prevention and dental evaluation.*

*Dental abscess may be a condition of maximum discomfort and extremely painful, imposing therapeutic intervention in a short time. If only antibiotic and anti-inflammatory treatment are applied, although this medication will ameliorate or symptoms will remit a period, will not solve the associated dental injuries and subsequent expression will follow the trends in injuries.*

***Keywords:*** abscess, prevention, extraction

### ***Introduction***

Dental abscess is a collection of pus formed inside the tooth, the gum or correspondent alveolar bone substrate and is due to a bacterial infection with untreated dental disease as a substrate.

Etiopathology of dental abscess is diverse, but most often is determined by the appearance of an untreated periodontal pockets, trauma, fracture or tooth decay. Microbial population involved in causing dental abscess is diverse, from representatives of gram-positive bacteria like *Staphylococcus spp.* and *Streptococcus spp.*, most frequently identified, particularly in the early stages of periodontal disease, to anaerobic gram-negative as *Bacteroides fragilis*,

*Peptostreptococcus*, *Porphyromonas Gula*, *Porphyromonas salivosa*, *denticanis Porphyromonas*, *Prevotella intermedia*, *Treponema spp.*, *Bacteroides splanchnicus*, and many others, frequently mentioned in the literature. As the infection spreads, the pulp is destroyed and substrate jaw bone begins to be affected. During the infection installs jaw pain is likely to decrease in intensity, the general condition is improving with the animal, but in fact the situation worsens. Pain reduction is explained by the fact that with the dissolution of the jaw bone substrate, it produces a corresponding deterioration in regional nerve, damage which can lead to nerve death.

If not treated, the infection can migrate to other organs with impairment of general condition, threatening the patient's life.

### ***Materials and methods***

The cases considered in this study have been recorded in our praxis during 2015, patients, representatives of different races and genders, with a mean age 8-9 years (range 5-14 years), in most cases small and medium-sized animals, all cases exhibiting clinical symptoms and changes in haematology and biochemistry.

### ***Results and discussions***

Due to physiology and anatomy of oral cavity in dog, dental abscesses occupy second place in dental pathology of this species after periodontal disease in most of the cases as a direct consequence of it and are often diagnosed late due to missing or not applying protocols in dental prophylaxis and evaluation (Fig. 1).

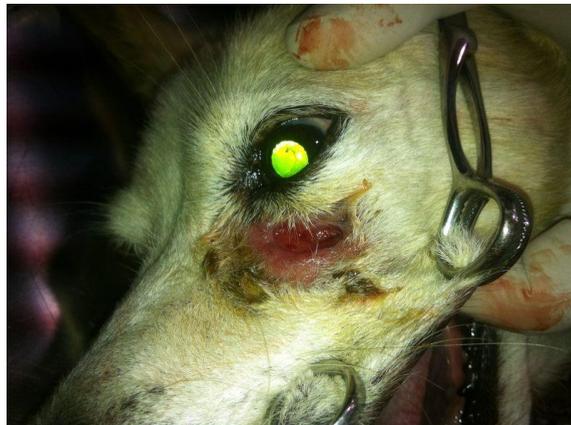


Fig.1. *Fistulising abscess*

Because in most cases the diagnosis is made in advanced stages, following an apparent symptomatology, with general clinical implications, it is limited in therapeutic drug intervention and imposes the extraction and reconstructive surgery.

Dental abscess is due to a bacterial infection with untreated dental disease as a substrate (Fig. 2).



Fig. 2. Abscess, radiologic aspect (pm4, m1, m2, p3)

In the analyzes of our patients, made in partner laboratories, the most frequently identified antimicrobial agent was *Staphylococcus pseudintermedius beta haemolytic* (Fig. 3).



Fig. 3. Advanced periodontitis

Symptomatology is represented by discomfort during chewing and pulsatile pain in the infected area, accentuated when the region is palpated. In dogs this condition is manifested by avoiding chewing on the affected side, impaired prehension, salivation and loss of appetite appearance. This abscess is not always correlated with the appearance of clinical signs. Without specific treatment, the patient's condition degrades, and other symptoms appear such as fever, bad breath, physical fatigue, modification of corresponding area to the affected tooth and expression of blood and purulent abscess collection.

In dogs, the most common clinical expression of the abscess is extraoral, in the infraorbital region to corresponding premolars and molars (P4, M1, M2, P3), the aetiology being likened to the contiguous superior room. Dental radiography is mandatory for certainty diagnosis (Fig. 4).



Fig. 4. *Oro-nasal tract highlight radiological*

There are three types of dental abscess:

Gums abscess: is present only on the gums level and do not affects the tooth or periodontal ligament.

Periodontal abscess: starts from tooth bone support structure.

Periapical abscess: located in the soft pulp of the tooth (Fig. 5).



Fig. 5. *Aspect of abscess cavity*

In dogs, most often due to late stages when diagnosed, dental abscess treatment is firstly surgical extraction of the tooth affected and broad spectrum antibiotic or appropriate antibiotic sensitivity (Fig. 6).



Fig. 6. *Curettage of the abscess*

## ***Conclusions***

Dental abscess and most other dental diseases can be prevented through good oral hygiene at home, complemented by regular veterinary dental visits, scaling and cleanings under anaesthesia and avoiding dental injuries from playing with hard objects or bones.

Also brushing prevents the appearance of plaque and tartar, promoters of periodontal disease and tooth abscess.

Veterinary dental visits and conducting regular professional dental hygiene are required to maintain oral health.

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