

## CADMIUM LEVEL IN SOME TISSUES AND ORGANS FROM WILD BOAR

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### ABSTRACT

The wild boar (*Sus scrofa*) is one of the most common species of Romanian wild game. It's meat is found often on the market and in peoples menu list.

One of the most dangerous heavy metals is cadmium. It has several toxic effects on: kidneys, liver, testes, bones [2, 5].

The study was carried out in three different areas regarding the contamination level with heavy metals: Forest District M., Forest District. C and Forest District S.

Cadmium concentration was directly correlated with the pollution degree of the three different areas Forest District M. >Forest District C.> Forest District T.

Cadmium concentration in wild boar tissues and organs was: in Forest District C. between 0.009 ppm and 0.341 ppm; in Forest District M. between 0.011 ppm and 5.346 ppm and in Forest District T. between 0.007 ppm and 0.123 ppm.

### INTRODUCTION

In Romania the hunt is more and more popular and the wild game meat is more often found in peoples menu. One of the Romania's wild game is the wild boar (*Sus scrofa*). It has a large spread on the country territory from Danube Delta till the Carpathians Mountains [1, 3].

Wild boars meat is often found on restaurants menu list and in supermarket. The industry development is higher and it is affecting the wild life through the pollutants that they release in the atmosphere. These pollutants are carried by wind drafts many kilometers away and so they have the possibility to come in direct contact with wildlife [6]. The areas were selected regarding the degree of risk pollution with heavy metals.

### MATERIALS and METHODS

The study was carried out on 70 wild boars during four hunting seasons (2005-2009) in Forest District C. (county A.) and Forest District M. (county S.) and only two hunting seasons (2007-2009) in Forest District S. (county T.). The three Forest Districts had different level of heavy metals contamination.



The aim of the study was to determine cadmium level in wild boar tissues (bones and muscles) and organs (heart, liver, kidneys, spleen, lungs and testes).

Cadmium concentration was determined by atomic absorption spectroscopy (AAS AA-6650 Shimadzu) after microwave digestion by CHEM MARS X.

The data were statistically performed by ANOVA method and Student test.

## RESULTS

Cadmium level in wild boar tissues and organs was determined in samples collected during the legal hunting seasons.

A summary of the results for cadmium concentration in wild boar tissues and organs from Forest District C. is given in table 1.

Table 1. Cadmium concentration in wild boar tissues and organs from Forest District C.

Tissues and organs	Hunting season			
	2005-2006	2006-2007	2007-2008	2008-2009
Liver	0,081	0,097**	0,096 <sup>ns</sup>	0,094 <sup>ns-a / ns-b</sup>
Kidneys	0,096	0,124**	0,341**	0,210** - a / ** - b
Lungs	0,064	0,064 <sup>ns</sup>	0,082*	0,089* - a / * - b
Heart	0,015	0,021 <sup>ns</sup>	0,027 <sup>ns</sup>	0,045 <sup>ns-a / * - b</sup>
Spleen	0,022	0,025 <sup>ns</sup>	0,037 <sup>ns</sup>	0,022** - a / <sup>ns-b</sup>
Testicle	-	0,010	0,014 <sup>ns</sup>	0,017* - a /
Muscles	0,012	0,026**	0,031*	0,021** - a / ** - b
Bones	-	0,010	0,009 <sup>ns</sup>	0,010 <sup>ns-a /</sup>

\*\* :  $p < 0,01$ ; \* :  $p < 0,05$ ; <sup>a</sup> / <sup>b</sup> : <sup>a</sup> / - 2008-2009 / 2007-2008; / <sup>b</sup> - 2008-2009 / 2005-2006

A summary of the results for cadmium concentration in wild boar tissues and organs from Forest District M. is given in table 2.

Table 2. Cadmium concentration in wild boar tissues and organs from Forest District M.

Tissues And organs	Hunting season			
	2005-2006	2006-2007	2007-2008	2008-2009
Liver	0,256	0,364**	0,572**	0,561** - a / ** - b
Kidneys	2,340	3,541**	5,012**	5,346** - a / ** - b
Lungs	0,125	0,100**	0,091**	0,144** - a / ** - b
Heart	0,096	0,134 <sup>s</sup>	0,135 <sup>ns</sup>	0,125** - a / ** - b
Spleen	0,050	0,072**	0,110**	0,170** - a / ** - b
Testicle	-	0,045	0,030**	0,025** /
Muscles	0,065	0,072*	0,074**	0,146** - a / ** - b
Bones	-	0,011	0,011 <sup>ns</sup>	0,012** /

\*\* :  $p < 0,01$ ; \* :  $p < 0,05$ ; <sup>a</sup> / <sup>b</sup> : <sup>a</sup> / - 2008-2009 / 2007-2008; / <sup>b</sup> - 2008-2009 / 2005-2006

A summary of the results for cadmium concentration in wild boar tissues and organs from Forest District T. is given in table 3.



Table 3. Cadmium concentration in wild boar tissues and organs from Forest District T.

Tissues And organs	Hunting season	
	2007-2008	2008-2009
Liver	0,072	0,081 <sup>ns</sup>
Kidneys	0,123	0,105**
Lungs	0,064	0,065**
Heart	0,021	0,020 <sup>ns</sup>
Spleen	0,026	0,031 <sup>ns</sup>
Testicle	0,009	0,012 <sup>ns</sup>
Muscles	0,012	0,014**
Bones	0,007	0,011 <sup>ns</sup>

\*\* :  $p < 0,01$  ; <sup>ns</sup> : nezemnificativ

Mean cadmium concentration dynamic in wild boar tissues and organs during the four hunting season in the three Forest Districts in summarized in figure 1.

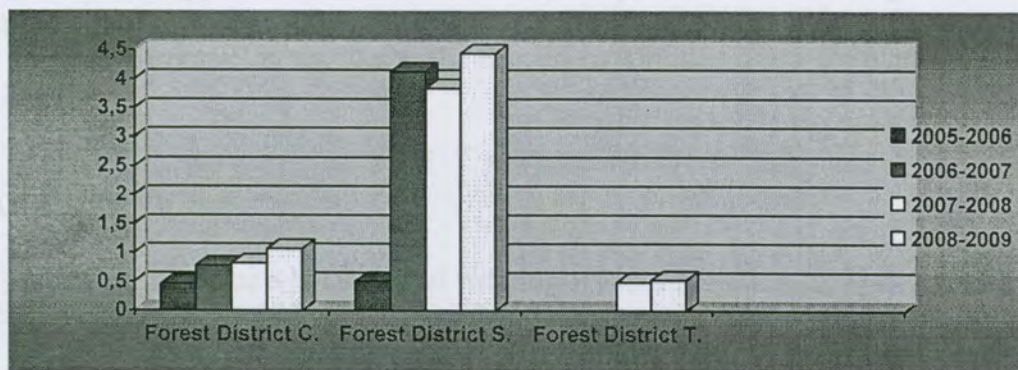


Fig. 1. Mean cadmium concentration in wild boar tissues and organs during 2005-2009 hunting seasons

## CONCLUSIONS

- cadmium concentration was directly correlated with the degree of pollution;
- tissues and organs hierarchy regarding cadmium concentration was:
  - in Forest District C.: kidneys, liver, lungs, heart, spleen, muscles, testicles, bones;
  - in Forest District M.: kidneys, livers, heart, lungs, spleen, muscles, testicles, bones;
  - in Forest District T.: kidneys, liver, lungs, spleen, heart, muscles, testicles, bones.
- cadmium concentration in tissues an organs for human consumption (muscles, liver, kidneys) overcome the maximum admitted limit (CE Directive 1881/2006) [7] for al

samples and hunting season in Forest District M. and liver in Forest District T. (also both hunting seasons) and was under in Forest district C. and muscles and kidneys in Forest District T.

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