

Sborník přednášek  
11. mezinárodního symposia

Proceedings of the  
11<sup>th</sup> International Symposium

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**Aktuální problémy šlechtění,  
chovu, zdraví a produkce  
prasat**

**Current Problems of Breeding,  
Health and Production  
of Pigs**

*kolektiv autorů*  
*collective of authors*

ISBN 80-85645-44-0

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19. – 20. února

2002

19<sup>th</sup> – 20<sup>th</sup> February

## COMPARATIVE INVESTIGATION OF THE EVALUATION OF PORK MERCURY CONTAMINATION IN THE GRODNO MARKET (BELORUSSIA) IN THE YEARS 1998 – 2001

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Mercury present in the animal and human habitat originates both from natural sources and as an effect of inconsiderate economic activities. Not only industry but also agriculture is responsible for increasing environmental contamination with this heavy metal. By passing the successive links of the food chain, mercury compounds originally used as seed treatment come back to animals and man. Production of mercury seed dressings was terminated in Poland in 1978. However, in the neighbouring countries these preparations were still in use even at the beginning of the nineties, e.g. in the Czech Republic, and in some countries they are still in use, e.g. the former republics of the Soviet Union. Also Belorussia still uses preparations containing the alkyl mercuric derivatives with the general formula R-Hg-X. It causes the danger of mercury contamination of feeds and indirectly of water for animals and in consequence the products of animal origin. An additional factor increasing mercury contamination in Belorussia is the use of dried lake bottom sediments in animal feeding.

The aim of our investigation was the evaluation of the degree of mercury contamination of fatteners from the Grodno region and the comparison of that element level in pigs from the region of Poland which borders Belorussia.

### Material and Methods

Meat samples from 10 fatteners of about 150 kg b.w. were collected in the covered market in Grodno and municipal slaughter house in Dąbrowa Białostocka (formerly Grodzieńska) from 16 to 18 November 1998. The samples included segments of the gluteal muscles, liver and kidneys. The investigation was repeated at the same time in 2001. The mercury contents was determined by the ASA method with the help of the mercury trace analyser AMA-254. The sensitivity of the apparatus was 0.01 ng Hg g<sup>-1</sup>. The obtained results were analysed statistically and the mean values, standard deviations and minimum and maximum mercury concentrations were calculated. The significance of differences between mean values obtained in both investigated regions were compared with t-Student test using the statistic packet Statgraphic 6+.

### Results and Discussion

Mercury levels observed in both investigated periods in the tissues of fatteners from the region of Grodno and Dąbrowa Białostocka are presented in the table.

Region	Number N	Parameter	Hg concentration in mg.kg <sup>-1</sup> fresh tissue			
			Muscle s	Liver	Renal cortex	Renal medulla
Grodno Belorussia November 1998	10	x	0.0011	0.0014	0.0025	0.0011
		s	0.0005	0.0005	0.0015	0.0005
		min.	0.0003	0.0006	0.0011	0.0003
		max.	0.0042	0.0025	0.0430	0.0035
Grodno Belorussia November 2001	10	x	0.0007	0.0010	0.0015	0.0008
		s	0.0005	0.0002	0.0009	0.0002
		min.	0.0001	0.0002	0.0005	0.0003
		max.	0.0011	0.0018	0.0139	0.0019
Dąbrowa Białostocka Poland	10	x	0.0010	0.0015	0.0065	0.0011
		s	0.0005	0.0005	0.0035	0.0005
		min.	0.0005	0.0005	0.0011	0.0005
		max.	0.0020	0.0025	0.0150	0.0025

Mercury concentration in the pig muscle tissue in both investigated regions was similar and in any case it did not exceed the accepted standard 0.01 mg.kg<sup>-1</sup> Hg in meat products (1). The mean values and border values of the mercury level in the liver only to a small extent exceeded the concentration observed in the muscles and were also lower than the hygienic standards which are obligatory now. The investigations confirmed that the organ which selectively cumulates mercury is the kidney and in particular its cortical part where the filterable processes take place. The mercury level in the renal cortex in single cases exceeded the accepted levels of contamination meat products with this element. However, considering the fact, that the whole kidney is used for consumption as well as the increased tolerance scope of the standard for canned meat products including kidneys and livers, these values could be accepted as natural concentrations.

Comparing mercury levels in both border-regions of Poland (2,3) and Belorussia it can be stated that the degree of contamination of animal tissues, which is an indicator of environmental contamination, is similar and it does not arouse toxicological reservations. The 3 years later repeated investigation of the Hg contamination of pork meat offered by individual farmers on the Grodno market showed a significant decrease of the level of that element in the investigated material. It may be assumed that it may be connected with the reduced mercury emission to the environment as a result of industrial recession and the limitation of the use of chemicals in agricultural production.

## References

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