Case #6

Dr. Lukas Zielonka

Mycotoxins are secondary metabolites produced by mould fungi of *Fusarium, Aspergillus* and *Penicillium* during the cereal growth, harvesting and storage. They are present in many agricultural products all over the world and they potentially endanger food safety. It is estimated that the level of contamination caused by the micotoxins is high and each year it amounts to approximately 25% of the world food production.
Micotoxins produced by fungi of *Fusarium spp.* play a dominant role in our climatic zone. Zearalenone (ZEA) is listed among them. This xenobiotic is a micotoxin and a phytosteride with estrogenic effect.

The study was carried out on 16 mixed-breed gilts (Large White Polish x Polish Landrace) average body weight of 49.2 ± 3.6 kg. Their living and feeding conditions were good. During the experiment the animals were kept in individual cages with a permanent access to water. The gilts were fed with 3 kg of the commercial mixture twice with different doses of the xenobiotic a day at 6.30 a.m. and 3.00 p.m. Material used for feed production was free from zearalenone and other micotoxins e.g. ochratoxin A, aflatoxin, deoxynivalenole as determined with high performance liquid chromatography (HPLC) in the laboratory of Division of Veterinary Prevention and Feed Hygiene, Department of Veterinary Health Protection, Faculty of Veterinary Medicine, University of Warmia and Mazury in Olsztyn.
The experimental gilts were divided into groups: (i) group I-K (n=8) – control group; (ii) group II (n=8) - dose 100% higher than the lowest dose of ZEA (Zearalenone [17924-92-4] ICN Pharmaceuticals, Inc. USA), causing visible clinical signs of hyperestrogenism - 200μgZEA/ kg b.w.

Histopathological studies were made in the Department of Pathological Anatomy, Faculty of Veterinary Medicine, UWM in Olsztyn. The experiment was conducted for 8 days. On day 8 the pigs were slaughtered in the slaughterhouse according to the standard procedure. The tissues were taken directly after the sacrifice. They were fixed with 10% neutralised formalin (pH = 7,4) and embedded in paraffin. The paraffin sections were stained with HE.

In group II which was the group that was given xenobiotic, the signs of hyperestrogenism were noted clinically on day 5. Post mortem examination revealed parenchymatous degeneration in the liver cells, the enlargement of the lymphatic follicles and changes indicating the stimulation of their multiplication centres in the stomach. Numerous ovarian follicles in different maturity stadium were found in the ovary. The granulosa cells in 3 follicles was totally destroyed. Numerous vacuoles and lysis of cellular nucleus were noted in the visible follicular cells. Hyperaemia of the endometrium and the vulva and local oedemas in muscular layer of the uterus and the vagina.

References:

Zielonka _., Gaj_cki M., Obremski K., Zwierzchowski W.: Influence of low doses of deoxynivalenol applied *per os* on chosen indexes of immune response in swine. Pol. J. Vet. Sci. 6 (3), 74-77, 2003.

Obremski K., Gaj_cki M., Zwierzchowski W., Zielonka _., Otrocka-Domaga_a I., Rotkiewicz T., Miko_ajczyk A., Gaj_cka M., Polak M.: Influence of zearalenone on reproductive system cell proliferation in gilts. Pol. J. Vet. Sci. 6(4), 239-245, 2003.

Gaj_cka M., Jakimiuk E., Polak M., Otrocka-Domaga_a I., Janowski T., Zwierzchowski W., Obremski K., Zielonka _., Apozna_ski J., Gaj_cki M.: Zearalenone applied *per os* provides adverse effects in structure of chosen parts of bitch reproductive system. Pol. J. Vet. Sci. 7(1), 59-66, 2004.

Zielonka _., Gaj_cki M., Obremski K., Zwierzchowski W.: Wp_yw niskich dawek deoxynivalenolu podawanych *per os* na poziom tej mikotoksyny w surowicy krwi _wi_. Medycyna Wet. 60(5), 534-536, 2004.

Gaj_cki M., Przyby_owicz M., Obremski K., Zielonka _., Zwierzchowski W., Skorska-Wyszy_ska E., Gaj_cka M., Polak M., Jakimiuk E.: Preliminary results of monitoring research on zearalenone presence in blood of women with neoplastic lesions in reproductive system. Pol. J. Vet. Sci. 7(2), 153-156, 2004.