

Glyphosate is the active substance of herbicides commonly used in agriculture. Global population growth contribute to increasing the yield of crops. Soybeans, wheat, oats and maize have a particularly high content of glyphosate in the grain, and they are the basic ingredient of animal feed. Glyphosate has also been shown to accumulate in surface water and soil through an affinity for mineral phase. Research on glyphosate residues in food products has shown a high content of this herbicide in oilseeds and vegetable oils, breakfast cereals, beer, eggs, mineral water, bread and other grain products.

Toxicological studies have shown the negative effects of glyphosate on living organisms such as fish, amphibians, reptiles, birds, rodents and some farm animals. Glyphosate is teratogenic, carcinogenic, neurotoxic, induces endocrine disorders, metabolic changes and reproductive disorders. The toxicity of glyphosate depends on the dose and the time of exposure. The adverse effects of glyphosate on the female reproductive system have been confirmed in studies using fish, rodents and lambs. Glyphosate is classified as a hormone-disrupting compound, it leads to morphological and histopathological changes in the ovaries, such as interstitial fibrosis, a reduced number of mature follicles and an increased number of atretic follicles, ovulation disorders and gametogenesis, causing cycle disorders, infertility or endometriosis. Glyphosate also leads to an increase in the expression of genes and markers of oxidative stress in the serum. The functions of the pig uterus are controlled by the autonomic (sympathetic and parasympathetic) and sensory nerve centers.

In the proposed research for the first time will be used low doses of glyphosate which are corresponding to real environmental exposure of people and animals for this substance. The aim of this project will be to determine the effect of low doses of glyphosate on uterine morphology and innervation, localization of receptors for the tested neurotransmitters, and to evaluate the effect of glyphosate on uterine contractile activity *in vitro*.

This research will be carried out in a domestic pig model because pigs are embryologically, anatomically and physiologically similar to humans. Pigs have a high importance in biomedical research, concerning also the reproductive system.