

Over the past few decades, the poultry industry has been the most rapidly developing branch of animal production. In 2018, global poultry meat production overtook pork production. Poland is the largest producer of turkey meat in Europe, and the third largest producer of turkey meat in the world (approx. 600,000 tons per year). The high performance of turkeys, observed nowadays, is the consequence of genetic progress and rational nutrition, supported by the results of studies investigating the key factors that determine the health status of birds, promote their fast growth and improve the quality of their meat. Modern fast-growing turkeys are characterized by increased susceptibility to adverse environmental conditions and infections, which often necessitates the use of antibiotics. Antibiotics are often administered to turkey poults during the first days of their life, as part of the so called metaphylaxis. On the other hand, meat producers, including poultry producers, are under tremendous pressure to reduce antibiotic use. In the European Union, the use of antibiotics as growth promoters in animal feed was banned in 2006. However, continuous use of coccidiostats (including ionophore coccidiostats), which are also classified as antibiotics, is still permitted. Paradoxical situations have been reported where a given antibiotic could not be used as a growth stimulator but could be administered as a coccidiostat (e.g. salinomycin in chickens).

The current challenge facing poultry (including turkey) production is the need to reduce the amount of antibiotics administered to birds. All EU Member States have committed to reduce the use of antimicrobials in animal production by 50%. A thorough knowledge on the biological effects of early antibiotic administration and continuous use of coccidiostats in young turkeys can greatly contribute to achieving this goal because there is no empirical evidence that early antibiotic administration does not interfere with the physiological mechanisms for transferring maternal immunity to poults and developing defense mechanisms against pathogens.

The objective of the proposed study is to broaden the existing knowledge about the effects of early administration of antibiotics to turkey poults as well as continuous use of ionophore coccidiostats in diets for young turkeys. This is an important consideration in view of the current challenges facing intensive poultry farming. The research hypothesis postulates that early antibiotic administration inhibits yolk sac resorption and decreases the transfer of maternal antibodies to the circulatory system of poults, which may reduce their humoral immunity during the first few days post hatch, thus compromising immune function (immunosuppression) and the antioxidant status of birds. Diets containing coccidiostats can exert similar effects in turkeys.

If the research hypothesis is validated, the results of the project will be used to adjust the existing prevention and treatment programs applied in the early life stages of turkeys. The research findings can be extrapolated to other poultry species and, partially, to other livestock species and humans.