In the last decade, a rapid increase in the number of intensive farms (mainly chickens) has been observed in Poland. In this industrial process, specific conditions are created for rapid chicken weight gain in a 6-week fattening cycle (selection of the best meat chicken breed, 24h access to food and water, non-stop light availability in the first cycle stages, the use of vaccines and drugs including antibiotics, removal of poultry litter after whole cycle).

During the breeding of chickens many adverse phenomenons are observed such as:

- high concentrations of toxic substances (including ammonia) in the indoor air of the chicken house, as well as high concentrations of bioaerosol, which negatively affects animal welfare and probably affects the employees' health;
- emissions of bioaerosol and odors to the outdoor air and the likely impact of these pollutants on the state of the environment and the health of people living nearby the farms;
- transporting manure contaminated with drugs to agricultural fields, which causes soil and groundwater pollution.

Few literature reports exist regarding the impact of pollutants emitted from intensive farming on the health (in particular negative impact on the respiratory system) of employees and residents living nearby the chicken farms.

In this context, the following questions are urgent (the purpose of the work):

1. what is the chemical and microbiological composition of the aerosol formed during intensive farming of chickens?
2. what is the scope and the impact on the health of employees and people living nearby farms, including quality of life?
3. how do soil properties and their quality change in the area of impact of intensive poultry farming (presence of chemical pollutants, changes in soil biological activity, changes in the composition of the microbiome, ecotoxicity, drug resistance)?
4. Do drugs (antibiotics) transfer from agricultural soils fertilized with manure to water and crops and pose a threat to consumer health?

We intend to obtain answers to the questions listed above by carrying out the following tasks:

1. Assessment the exposure of poultry farm workers to chemical and microbiological agents with development of health protection guidelines for the mentioned above working environment.
2. Exposure assessment of people living nearby industrial farms to chemical and microbiological factors present in air, water and soil. Epidemiological studies of local residents as well as biomedical studies of nasal swabs.
3. Ecotoxicological assessment of changes in the soil and water environment (including genotoxicity, endocrine disriptor assay) and assessment of drug resistance and microbiome around chicken farm.
4. Analysis of the impact of nutrients and pollutants from intensive poultry farming on the soil environment.
5. Assessment of changes in plants cultivated on soil fertilized with manure from intensive farming.
6. Range of intensive poultry farms impact - spatial transport modeling of pollutants.

These tasks will be carried out by a research team composed of specialists from four research centers (Medical University of Gdańsk (GUMed), Central Institute for Labour Protection (CIOP), Institute of Soil Science and Plant Cultivation (IUNG), University of Warmia and Mazury in Olsztyn (UWM)) having long-term experience in the respective fields and possessing properly equipped laboratory facilities.

Intensive chicken farming is associated with a number of negative environmental and health aspects (phenomena). Only some of them have been recognized and described scientifically. Due to the rapid development of this food production technology and the rapid increase in the number of farms, it is necessary to obtain objective knowledge about the environmental and health effects.

We expect that the identification of chemical and microbiological factors emitted during poultry farming and the identification and assessment of the environmental and health effects will contribute to a better understanding of contaminants generated during intensive farming, which will allow to conduct real assessment of the environmental and health effects, and should translate into improved quality of life farm workers, local residents and consumers.