Examination of the influence of IPN virus on the course of jersiniosis in rainbow trout (*Oncorhynchus mykiss*).

Fish as a food product is an irreplaceable source of protein, fatty acids, vitamins also micro and macronutrients. Due to increase of human population number the demand for wholesome food products, including fish is increasing. Fish consumption is however, largely limited by the high price, which is increased by the economic losses due to illness and disease treatment.

One of the most common farmed fish is the rainbow trout (*Oncorhynchus mykiss*). Economic losses to the culture among other, are caused by the bacteria *Yersinia ruckeri* (*Y. ruckeri*), the aetiological agent of enteric red mouth disease (ERM) and IPN virus (IPNV) that causes infectious pancreatic necrosis (IPN). Both of these pathogens are widespread in the world and the available vaccines are not fully effective. New strains of *Y. ruckeri*, classified as biotype 2, have the ability to cause disease in fish previously vaccinated with vaccine based on biotype 1. Introduction of vaccines based on both biotypes reduced losses resulting from the disease, but the outbreaks of the disease in vaccinated fish are still noted.

The aim of our research is to determine the relationship between IPNV infection and the course of yersiniosis in rainbow trout. An effect of correlation between viruses and bacteria has been observed and confirmed in case of numerous diseases of humans and other mammals. There are no reports regarding the impact of the IPNV on *Y. ruckeri* infection in the literature. However, field observations and our preliminary study suggest that there is a correlation between infections with these pathogens. Our study will update the current knowledge in terms of epidemiological situation in north-eastern Poland. In standard microbiological procedures biotyping is not included. In our project, collected strains of *Y. ruckeri* will be characterized both in terms of belonging to a particular biotype and serotype which will allow the development of more effective methods of prevention. Our research will also contribute to the extension of the diagnosis and show the benefits of simultaneous examination of viral and bacteriological agents.

The first stage of our research will be collecting of field strains of *Y. ruckeri* in north-eastern Poland and their characteristics. In the second stage we will conduct the experiment to determine the relationship between IPNV infection and the course of yersiniosis. Study will be carried out in pools with recirculating aquaculture systems (RAS), in the Laboratory of Fish Diseases, Department of Epizootiology, Faculty of Veterinary Medicine, UWM in Olsztyn. The fish will be subjected to experimental infection. There will be 50 fish in each group. Following the acclimatization period, fish will be experimentally infected. Group no. 1 and 3 will be infected with the reference IPNV strain. After two weeks and confirmation of the presence of IPNV in infected fish, group no. 2 and 3 will be infected with a pathogenic *Y. ruckeri* strain. Group 0 will remain uninfected and serve as a control. Over a period of 45 days post infection fish will be controlled twice daily (during first week) and thereafter once a day. In addition, during the experiment, five fish from each group will be sampled to test the presence of IPNV and *Y. ruckeri* and assess the impact of infection on the immune response. In order to identify the tested pathogens, we will develop multiplex PCR method that allows the simultaneous identification of both pathogens. Evaluation of the course of infection and the condition of the fish in each group will demonstrate whether the IPNV infection affects the course of *Y. ruckeri* infection.

In the case of fish disease, the literature about the correlation between viral infection and bacterial pathogens are scarce. There is no information, concerning whether the infection with the IPNV influences the pathogenicity of *Y. ruckeri*. Our field observations indicate that these pathogens often occur together. Moreover our preliminary results show increase in mortality in group infected with both pathogens. In 2015, we isolated *Y. ruckeri* from clinically healthy fish that were carriers of the IPNV. After a period of a few weeks, the fish from the farm adjacent began to fall ill with typical symptoms of yersiniosis. These fish were tested for *Y. ruckeri* one month earlier, with negative results, suggesting that the bacterium was transferred from a neighboring farm. Fast diagnosis of these two pathogens may help to reduce the spread of these diseases.