

USDA ARS participant contributed research to defend the poultry industry

By Jordan Stidham



In the U.S. Department of Agriculture Agricultural Research Service Research Participation Program, Ioannis Sitaras, Ph.D., researched the evolution of the avian influenza virus, seeking to reduce poultry disease and mortality.

Every year around the world poultry deaths from avian influenza infections reach hundreds of millions. The financial impact of a large avian influenza epidemic is estimated to be in the billions of dollars.

In an effort to combat poultry disease and mortality, Ioannis Sitaras, Ph.D., fulfilled his postdoctoral research interests when he was accepted to participate in the U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS) Research Participation Program at the U.S. National Poultry Research Center (USNPRC) in Athens, Georgia.

The USDA ARS Research Participation Program provides opportunities for students, postgraduates, established scientists and faculty to participate in programs, projects and activities at ARS-designated facilities to help ARS solve agricultural problems of high national priority.

Sitaras received his doctoral degree in virology and epidemiology in 2017 from Wageningen University and Research in the Netherlands. It is the only university in the Netherlands to focus on food safety and the environment.

At the university, he was a leader in the development of a comprehensive protocol for the selection of immune-escape mutants of highly pathogenic avian influenza (HPAI) H5N1 viruses. These immune-escape mutants represent a major issue for the poultry industry; they are able to escape vaccination-induced immunity and have the potential to transmit to humans if preemptive measures are not taken.

Under the mentorship of research microbiologist Erica Spackman, Ph.D., Sitaras applied his knowledge toward avian influenza virus (AIV) research by joining USNPRC's influenza groups.

Research was carried out to determine how easy it is for AIV to change resulting from vaccination. For this, Sitaras and his colleagues used a variety of avian influenza viruses of either domestic or foreign origin.

During these investigations, the team researched how AIV can mutate as a consequence of vaccination-induced immune pressure. This research aimed to shed light on how the virus behaves and how to effectively protect U.S. poultry from potential avian influenza infections.

Sitaras, who specializes in infectious diseases, virus evolution, vaccination and epidemiology, conducted experiments to select for immune-escape mutants. He prepared vaccines and checked their efficiency to stop the infection of animals.

This program has benefited Sitaras by offering him hands-on experience working with chickens, knowledge of the poultry industry, and the opportunity to better understand the differences between different strains of AIV.

“The knowledge obtained during the program will help me further my research career in the future and reach my professional goals,” he said.

His professional goals include doing high-quality research in AIV evolution and vaccination, publishing his work in peer-reviewed journals, gaining an understanding of the poultry industry and determining how to effectively protect the poultry industry from avian influenza infections.

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