News & Views

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College Receives Major Grant to Study Johne's Disease

The College of Agricultural Sciences has been awarded a four-year, $4.8 million grant from the U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service to support phase two of a major international effort aimed at promoting animal biosecurity and mitigating losses from Johne's disease in livestock.

The Johne's Disease Integrated Program (JDIP)—a consortium of 170 scientists from more than 50 leading academic institutions, government agencies, and industry organizations from around the world—is led by Vivek Kapur, head of Penn State's Department of Veterinary and Biomedical Sciences.

The program's research emphases include epidemiology and transmission of Johne's disease; the development of diagnostic tests; understanding the biology of the pathogen and how it causes the disease; and studying how the body responds to the pathogen, with an eye toward vaccine development.

In addition, the program has a large outreach component designed to train veterinarians and producers so they can better manage, control, and prevent the disease.

Johne's disease (pronounced YO-knees) is a chronic, bacterial intestinal disease of cattle and other ruminants (sheep, deer, goats) that can cause weight loss, diarrhea, and decreased milk production. National estimates indicate that up to 70 percent of dairy herds and a smaller percentage of beef herds have cattle with Johne's disease. Although not scientifically proven, the bacteria that cause Johne's disease also may be associated with Crohn's disease in humans.

Annual economic losses to producers as a result of Johne's disease are estimated at more than $14 million in Pennsylvania, up to $500 million in the United States, and as much as $1.5 billion worldwide. An objective of JDIP is to help reduce these losses by shortening the time between discovery research and its field application.

Kapur notes that the grant—which may be the largest competitive USDA grant Penn State ever has received—will enable the Johne's consortium to build on the accomplishments from the first three-year phase of the project.

"Our collaborative work has led to improvements in diagnostic tests, a better understanding of mechanisms of disease transmission and pathogenesis, and the identification of new vaccine candidates," he explains. "Our consortium also has enabled the development of online training programs on Johne's disease for veterinarians and producers."

Improved sampling and testing strategies developed by JDIP are currently being incorporated into USDA's Voluntary Bovine Johne's Disease Control Program. Information generated by JDIP also has enhanced many state Johne's certification programs. The Pennsylvania Johne's Disease Herd Certification Program, sponsored by the state Department of Agriculture in cooperation with Penn State, is one of the nation's longest-running voluntary Johne's disease monitoring-and-control programs.

Robert Steele, dean of the College of Agricultural Sciences, says the new round of JDIP funding builds on the college's existing strengths. "Coordinating this Johne's disease program dovetails with the college's growing capacity in infectious-disease research," he says. "With our cooperative extension programs and participation in the state's animal diagnostic laboratory system, the college is well positioned to conduct and translate research that can enhance animal and human health."

—Chuck Gill