

Contact: Rachel Boon

**REQUEST FOR NEW PROGRAM AT IOWA STATE UNIVERSITY:
DOCTOR OF PHILOSOPHY IN POPULATION SCIENCES IN ANIMAL HEALTH**

Action Requested: Consider approval of the request by Iowa State University to establish a Doctor of Philosophy in Population Sciences in Animal Health in the Department of Veterinary Diagnostic and Production Animal Medicine (VDPAM) in the College of Veterinary Medicine.

Executive Summary: The Council of Provosts and Board office support approval of this program.

Background:

Description of proposed program. The Population Sciences in Animal Health doctoral program will be administered by the Department of Veterinary Diagnostic and Production Animal Medicine (VDPAM) in the College of Veterinary Medicine. The mission of the program is to equip future leaders (veterinarians and non-veterinarians) with the knowledge and skills to protect and promote the welfare and health of animals in populations. The program will be built on the existing departmental infrastructure, the current MS in Veterinary Preventive Medicine program administered by the department, and faculty expertise/research activity. The purview of the program is broadly inclusive (wildlife, companion animal, livestock and poultry populations), with emphasis on Iowa livestock and poultry because of their numbers and impact.

Academic objectives. The objective of the program is to train future leaders (veterinarians and non-veterinarians) and create/disseminate knowledge in the area of Population Sciences in Animal Health. Program graduates will be prepared to respond to health and welfare issues in animal populations through research, education, clinical medicine, extension and outreach. The program will be structured and administered in accordance with the policies and rules established by the Iowa State University Graduate College. In brief, the student's work and progress will be under the supervision of a major professor and a Program of Study committee. Successful completion of the program will be achieved through the defense of a doctoral dissertation and completion of a minimum of 72 credits.

Need for proposed program. The VDPAM External Advisory Board, a body composed of stakeholders from public and private sectors, has repeatedly urged the department to create a doctoral degree program because of the strength of the faculty, the reputation and visibility of the department, and the need for research and outreach in animal health and animal welfare in Iowa and beyond. The board meeting minutes of 09/28/2015 stated, the "general consensus (among board members) was that a VDPAM PhD program would grow much needed research for the livestock and poultry industries and further VDPAM's national and international reputation".

In addition, the most recent external Academic Program Review team's report to CVM Dean Nolan (May 31, 2012) characterized VDPAM as "an outstanding and extremely productive department" and went on to raise the question of "... whether a large department can attain pre-eminence in their field without a strong graduate program that includes the PhD degree."

VDPAM has administered the interdepartmental MS in Veterinary Preventive Medicine since 2000 and a certificate in Veterinary Preventive Medicine since 2011. To date, 39 students have completed and been awarded the MS degree, with 20 students currently enrolled. Seven students have completed the certificate program, with an additional five currently enrolled. Graduates of the MS or certificate programs typically continue on with doctoral programs at ISU or elsewhere.

Other graduates have taken positions in areas related to livestock production, agricultural pharmaceuticals, veterinary vaccines, academia and government.

Link to institutional strategic plan. The Iowa State University 2017-2022 strategic plan set the goal of “grow(ing) the impact and scope of graduate programs,” in part by expanding the “number of PhD degrees conferred”. The plan strives to “improve services and programs dedicated to economic development and the promotion of healthy communities, people and environments,” in part by improving applied research and outreach programs.

The ISU CVM 2011-2016 strategic plan set the goal of “building disease prevention and risk assessment expertise to improve food safety and security, biosecurity, vaccinology and therapeutics/antimicrobial use.” The CVM is committed to becoming “a pre-eminent institution recognized for excellence in professional and graduate education; application of knowledge to promote animal and human health; and scientific leadership to provide a safe and sustainable food supply with state, national and global impact.”

The department of VDPAM was created in 1999 “to support the continual improvement of food animal agriculture and food supply veterinary medicine to benefit Iowa and the world.”

Relationship to existing programs at the institution. The proposed program is cross-disciplinary, and will potentially enhance opportunities for multidisciplinary research across Iowa State University. The program does not duplicate any existing program. Doctoral programs offered include the following:

- Veterinary Pathology (MS, PhD). Areas of emphasis include anatomic pathology, clinical pathology, or parasitology.
- Biomedical Sciences (MS, PhD). Areas of specialization include anatomy, physiology, pharmacology, and cell biology.
- Veterinary Microbiology (MS, PhD). This program offers the option of a PhD in Veterinary Microbiology with emphasis in Preventive Medicine by completing the required microbiology courses (bacteriology, virology and immunology) plus 4 courses in preventive medicine cross-listed with VDPAM and taught by VDPAM faculty. The proposed program does not require microbiology courses and will focus on population aspects of animal health.

Three other doctoral programs offered at ISU include some focus on animals:

- Animal Science (MS, PhD). This program has a broad focus in the animal science. Students take courses in breeding, nutrition, physiology, reproduction, and meat science, while focusing on one species of domestic animals. Areas of specialization in animal science are applied ethology, breeding, genetics, nutrition, physiology, reproduction, and meat science.
- Animal Breeding and Genetics (MS, PhD). Areas of specialization include quantitative genetics (PhD), molecular genetics (PhD), and immunogenetics (PhD).
- Ecology and Evolutionary Biology (MS, PhD). Self-described as “...the study of mechanisms controlling the composition, structure, and functional processes of ecological systems and the mechanisms that regulate the pattern and rate of evolutionary change within and among species.”

None of these programs share the proposed focus on the population-based approaches to veterinary preventive medicine, animal health and animal welfare.

Relationship to existing programs at other colleges and universities. The University of Iowa offers graduate programs addressing population health of humans in the College of Public Health, so

the Population Sciences in Animal Health degree does not duplicate it. The new program will expand opportunities to collaborate with the University of Iowa in multidisciplinary areas include "One Health." According to the Centers for Disease Control and Prevention (CDC) "*One Health recognizes that the health of people is connected to the health of animals and the environment. The goal of One Health is to encourage collaborative efforts of multiple disciplines—working locally, nationally and globally—to achieve the best health for people, animals and our environment.*" Moreover, CDC stated that "*One Health approach is important because 6 out of every 10 infectious diseases in humans are spread from animals.*" (<https://www.cdc.gov/onehealth/>)

Unique features. The College of Veterinary Medicine's expertise is animal health. VDPAM faculty are kept abreast of health issues in animal populations across the state of Iowa through their day-to-day responsibilities and field contacts within the Veterinary Diagnostic Laboratory, Veterinary Extension, Veterinary Field Services, Food Animal and Camelid Hospital, and Food Supply Veterinary Medicine sections.

Resources to establish a high-quality program. Within VDPAM, the breadth and depth of expertise represented in the faculty (n = 54) make the department uniquely qualified to lead the proposed program. There are 34 faculty holding a doctorate and thus in position to supervise students within the proposed doctorate program. VDPAM faculty are active and productive researchers. In FY 2015, VDPAM faculty generated \$27.6 million in extramural funding (102 active grants) and produced 111 refereed publications, 359 proceedings, and 249 abstracts.

The present physical and human resources are sufficient for the foreseeable program needs. That is, the program in Population Sciences in Animal Health will utilize resources that are currently available through the CVM and/or have been developed for the current Certificate and MS-level programs.

Student demand. Potential U.S. and international students currently join similar programs at other Universities including the University of Minnesota, the University of Guelph, University of California – Davis and/or Kansas State University. Each of these universities has a pool of 40-60 graduate students focused on population sciences.

The proposed program would leverage existing ISU CVM resources and open new opportunities to expand graduate student admissions by recruiting students enrolled elsewhere.

Workforce need/demand. The development of science and technology in animal health and welfare is proceeding at an unprecedented rate. Other parts of the world are applying "Precision Livestock Farming" techniques faster and more widely than in the U.S. To remain sustainable and economically competitive, we must evaluate and implement the best of the newest technologies with Iowa livestock producers. Independent producers and integrated production systems rely on land-grant institutions to stay on the leading edge.

In addition, recent events highlight the need to strengthen our capacity for early detection and rapid, effective responses to emerging/re-emerging animal agriculture issues in Iowa and elsewhere. Former Iowa Secretary of Agriculture Bill Northey noted that the recent (2014-2015) Pathogenic Avian Influenza outbreak was described by the USDA as the "largest animal health emergency in the U.S. history", and that "Iowa and Minnesota were the most severely impacted [among the 21 affected states]". He acknowledged the urgent need to "make additional preparations to a foreign animal disease outbreak" by "increasing the capacity of the animal industry bureau and providing resources to better equip and prepare for future responses". The VDPAM Population Sciences program will contribute bridging this gap.

Cost.

	TOTAL EXISTING COSTS	TOTAL NEW COSTS	TOTAL COSTS
Year 1	\$15,827	0	\$15,827
Year 2	\$16,302	\$30,000	\$46,302
Year 3	\$16,791	\$10,000	\$26,791
Year 4	\$17,295	\$10,300	\$27,595
Year 5	\$17,814	\$10,609	\$28,423
Year 6	\$18,348	\$21,855	\$40,203
Year 7	\$18,899	\$22,510	\$41,409

Projected enrollment.

Graduate	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Majors	2	4	8	12	16	22	28
Non-Majors	n/a						

Anticipated sources of students. Population Science in Animal Health builds on the current VDPAM MS in Veterinary Preventive Medicine (VPM). As previously noted, the proposed program complements and leverages this program by providing the possibility for strong students to achieve the terminal degree (PhD). We will recruit U.S. and international applicants from several areas:

- ISU veterinary graduates interested in Population Sciences in Animal Health. In 2016, 65% of ISU Veterinary Medicine graduates chose food or mixed-animal practice.
- Swine Medicine Education Center alumni. The Center's domestic and international outreach brings a high degree of visibility and the opportunity to recruit students with diverse backgrounds.
- Veterinary Preventive Medicine (MS and/or Certificate students)
- Professionals working in the field who seek further education to advance in research, teaching or service/outreach careers.
- Networking and academic and professional organizations such as American Association of Swine Veterinarians, American Association of Bovine Practitioners and American Association of Avian Pathologists.

Accreditation. Not applicable.

Evaluation plan. The VDPAM PhD program Director of Graduate Education will meet with graduate students twice per year: once in the spring semester with all students and once in the fall with each student individually. The objective of the meetings is to understand and document overall student progress, student concerns, and identify potential areas of improvement.

Additional tracking of graduation and placement, following key parameters:

- PhD graduates (total, concurrent, non-concurrent)
- Placement of PhD graduates
- Type of job for placed PhD graduates

Date of implementation. Upon approval by the Board of Regents