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Penn's Food Animal Program

The modern livestock producer is interested in the economic health of his operation and the welfare of his animals, and is willing to pay for professional services to correct issues that affect the operation's profitability. To meet the needs of this emerging dimension

of animal production the School of Veterinary Medicine

has changed its curriculum to allow students the opportunity to acquire skills in production medicine. The School's Center for Animal Health and Productivity (CAHP), established at New Bolton Center in 1986 to implement teaching, research, and service programs directed toward the improvement of health and herds and flocks, playing a vital role in shepherding the development of these courses.



Dr. Ray Sweeney and two students consult on a cow in the Marshak Dairy. The cow is free to feed as she chooses. The loose boxes are visible in the back.

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Penn's Food Animal Program

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They emphasize an integrated, interdisciplinary approach and involve disciplines such as clinical nutrition, reproduction, health economics, and computer science in addition to conventional specialties in veterinary medicine. The focus of the teaching program is to maintain the physical and economic health in whole animal populations as well as the clinical treatment of individual sick animals. As part of the program, the Marshak Dairy, the swine unit, and the sheep flock are managed to emulate real on-farm production systems. The facilities are used for teaching purposes in many of the courses throughout the four-year curriculum.

The last five years have seen a very rapid evolution of the food animal program at Penn, a program which will continually grow as the needs of agriculture change. In addition to the excellent tradi-

tional medical and surgical training, new courses have been developed to emphasize areas of current importance. Veterinary students have the opportunity to train with the 38 faculty and academic staff for essential roles in modern food animal production through the very best multidisciplinary training available anywhere.

The eight-week course in Production Medicine for fourth year students focuses on evaluating the health of the production system on the dairy farm by integrating and evaluating information on facilities, milking, reproduction, nutrition, database

systems, and environmental issues. Taught by the faculty of CAHP, Field Service, and Reproduction, with guest lectures by nationally-recognized experts in production medicine, the course combines lecture, laboratory, computer lab, farm visits, and a two-week internship with a veterinary practice. The computer lab at CAHP is used extensively to train students in the evaluation of production records and in formulating solutions to



The free stall wing of the Marshak Dairy, used for group-based nutrition studies.

Food Animal Fellows Program

As technology grows and the role of the food animal practitioner expands, fewer students are pursuing careers in this essential aspect of veterinary medicine. More and more students matriculating in veterinary schools are from urban backgrounds. Having had limited exposure to food animal production systems, they often find it difficult to make informed decisions regarding career selection. The Food Animal Fellows Program at New Bolton Center is designed to encourage qualified veterinary students to pursue careers in food animal medicine. The program supports several activities to give students an understanding of what it takes to be a modern food animal practitioner and to better understand modern animal agriculture.

Summer Fellowship Program: First and second year veterinary students are offered the opportunity to work with food animal practitioners for 10 weeks and to attend bi-weekly seminars on food animal production systems held at the Center for Health and Productivity at New Bolton Center. Students see a variety of animal production systems and get first-hand experience on the daily life of a food animal practitioner. They receive a stipend and course credit.

Students are accepted into the program based on essays submitted to the Food Animal Advisory Group. Since its inception in 1995 the program has had 29 students matriculated. The program also supports an externship for qualified students at the Miner Institute of Chazy.

Special Seminars: The Food Animal Fellows Program supports seminars on animal production issues presented by national and international speakers on issues germane to food animal production.

Food Animal Conferences: Students may accompany faculty on expense-paid food animal conferences. The annual Production Medicine Meeting and the Large Herd Conference of New York are often selected meetings. At these meetings, students are exposed to the most current issues facing animal agriculture from both the veterinary and producer perspectives.

Independent Study: There are also opportunities for independent study during the school year and summer months.

problems commonly encountered in dairy herds. Although the emphasis is on dairy, the principles are applicable to other herd/flock production systems.

The safety and quality of foods of animal origin is an area of mounting importance and concern, and the food animal practitioner has an important role to play in preventing and reducing the existence of chemical and microbial health hazards in the nation's food supply. The Swine Production Medicine Program was initiated five years ago in response to the health care needs of the Pennsylvania swine industry. Participating veterinary students study pork production across many dimensions, including animal health and welfare, food safety, economics, and environmental assurance. Poultry Population Medicine involves the control of infectious diseases in flocks, which is an important concern to both human health and to the economic health of the poultry industry. The Food Safety and Quality Assurance course was established three years ago to introduce students to regulatory, diagnostic, and biological factors they will need to consider when evaluating potential problems in a herd or flock.

New and drastically changed courses have emerged as more and more food ani-

mal veterinarians rely on computers to stay progressive. Animal Health Economics is taught as an elective course and covers animal production budgets, financial analysis, decision trees, linear programming, dynamic programming, and risk analysis. Students may elect to take independent studies for more advanced exposure to some of these



Drs. Paul Pitcher, Jim Beach and Tom Parsons consult next to one of the fleet of six Field Service trucks.

topics. Dairy Ration Formulation and Evaluation are now taught in the computer lab in several courses: Advanced Dairy Cattle

Nutrition, Ration Formulation, Dairy Production Medicine, and independent studies.

Throughout the fourth year, students can take rotations in New Bolton Center's Field Service practice, which includes dairy cattle, some beef cattle, small ruminants, and horses. Students travel to owners' farms with veterinarians in specially-equipped trucks, and acquire skills in palpation, surgery, and medicine. Field Service treated about 19,000 animals last year.

The Food Animal Medicine and Surgery rotation is given on-campus and focuses on the care and treatment of individual animals (as opposed to production medicine or population medicine, which focus on the herd or flock). The rotation is taught as a cooperative effort by faculty in the sections of Large Animal Medicine and Large Animal Surgery and residents from both sections.

In 1997 New Bolton Center began an Aquaculture study in Harnwell Pond



The milking parlor in the Marshak Dairy. Each cow wears a computer chip that identifies her and tracks her production output.

under the direction of Dr. David Nunamaker. This fish farming system for hybrid striped bass involves aerated cages placed in the pond. If it can be made cost-effective, it could become a source of income for properties with ponds. Elective courses in aquaculture are available to students during the third year.

The Food Animals Fellows Program was implemented to offer more exposure in food animal medicine to students in their first and second years. Students accepted as Fellows spend ten weeks during the summer working with food animal veterinarians and receive course credit and a stipend.

Both educational and social, the Food Animal Club has long been a part of the veterinary school experience at Penn. The club has become more organized and active in recent years, and includes lectures and activities emphasizing bovine, small ruminants, swine, poultry, and production aquaculture. Just as important, participation in club activities lets students see the wide range of options available to modern food animal practitioners.

Jeanie Robinson-Pownall

Members of the Section of Animal Health Economics and Nutrition and the Field Service contributed to this article.

The Marshak Dairy Facility at New Bolton Center

In 1996 the University of Pennsylvania School of Veterinary Medicine completed the construction of a state-of-the-art 200-head dairy barn for teaching and research. The Marshak Dairy Facility, named after former Dean Robert R. Marshak, is the only greenhouse-type barn in Pennsylvania. A greenhouse barn is energy efficient, naturally bright, and easy to keep dry, all essential conditions for comfortable and productive cows. Also, it is cost effective in terms of manpower and building expense.

The Marshak Dairy Facility at New Bolton Center serves as a living laboratory for the School of Veterinary Medicine and as a research and teaching site in such fields as epidemiology and preventative medicine, nutrition, reproduction, infectious and chronic diseases, and dairy cattle health economics. In addition, the Marshak Dairy Facility provides the region a resource with potential for commercial applications and enhances the teaching environment for veterinary and graduate students interested in the medical and managerial aspects of dairying.

"In order to adapt to our climate we've made design modifications to reduce heat build-up," Dr. David Galligan explains. "The shell of the building is pre-manufactured as a solar agriculture building, in essence, a plastic greenhouse." In the summer, the sides of the barn are rolled-up to facilitate cross ventilation. The facility consists of an administration area that includes a room with view of the double ten herringbone milking parlor; four sections of forty freestalls each where cows can walk, stand, and lie down where they choose; and a space for 48 tie stalls.

The tie stall area accommodates 48 cows that can be tied-up at feed bins for nutritional studies. Each cow can be fed a different mix and monitored by computer. The tie stall area can be converted to a freestall-style barn, if needed. Manure from the entire barn is deposited into an eight month holding tank and is periodically and strategically spread onto fields. This reduces the need for chemical fertilizer, cutting the overall farm cost.

There are 38 faculty and academic staff involved in the food animal program at Penn. A list of faculty along with their area of interest will soon be available at the CAHP web site at <http://cahpwww.nbc.upenn.edu/>

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after surgery to allow for complete healing of this delicate area.

The results of a study of this problem were presented by Dr. Dana King, a surgery resident working with Dr. Tulleners at New Bolton Center, at the 1997 annual Scientific Meeting of the American College of Veterinary Surgeons in Orlando, Florida. Dr. King reported that complications were not encountered, and healing was uniformly unremarkable. Laser surgery definitely improved racing performance on 73% of racehorses and eliminated noise in 75% of horses. In comparison, horses with ADAF that did not undergo surgery and that were rested for less than two months usually did not improve in racing performance when training was resumed.

As an example, ADAF was diagnosed in a talented horse who was the winner of multiple races and had earnings in excess of \$400,000. The trainer recognized a breathing problem after the horse atypically performed poorly in a race. Working carefully with the local track veterinarian, they were able to localize the problem to the throat region, but could not pinpoint the exact site. A high-speed treadmill evaluation at New Bolton Center performed by Dr. Eric Parente, a member of the Section of Sports Medicine and Imaging, confirmed the problem of ADAF. Standing laser surgery was performed to correct the problem, and the horse convalesced without complications. In the first start back the horse was back to usual form, winning handily.

While ADAF has been recognized only in recent years, it does illustrate the need for a high-speed treadmill evaluation in horses with suspected breathing problems.

"A comprehensive high-speed treadmill performance evaluation is a time-consuming, labor-intensive test which is not inexpensive to conduct due to the equipment and professional expertise needed. However, these caveats aside, I am convinced that the examination is an incredibly valuable diagnostic tool which is a worthwhile investment for owners and trainers with a horse which is not training up to its potential due to a suspected breathing or cardiovascular problem," commented Dr. Eric Tulleners. ■

Continuing Education Opportunities for Graduate Food Animal Veterinarians

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The University of Pennsylvania School of Veterinary Medicine participates in a number of Food Animal Continuing Education (CE) programs. The content of these courses reflects the on-going change in food animal agriculture and the demands of veterinarians to address these emerging issues.

• **Dairy Production Medicine**

Certificate Program: This joint program sponsored by Penn State and the University of Pennsylvania involves ten three-day modules given over a period of three years, including nutrition (heifer, dry cow, and lactating cow), housing and facility design, mastitis control programs, reproductive management, farm finances, and herd expansion. Many experts from throughout the country, including faculty from both the University of Pennsylvania School of Veterinary Medicine and Pennsylvania State University, teach in this CE program which results in a Dairy Production Medicine Certificate.

• **Software Development:** Faculty members at the School of Veterinary

Medicine's New Bolton Center are continuously involved in software development which can be used to teach veterinary students and post-graduate veterinarians.

• **Penn Annual Conference:** Two-day seminars have been given on Culling, Nutrition, Economics, Reproduction, Pregnancy Wastage, and Heifer Management with national and international speakers.

• **M.B.A. Program:** The School's CAHP has a joint MBA program with Penn's Wharton School that integrates the underlying principles of animal health and economics in livestock production systems. Through the Wharton MBA program, basic fundamental skills and principles in economics, finance, cost accounting, and operations research are covered. Students also complete an application project that explores the use of these principles to a problem in animal production. (n.b. There is also a concurrent VMD/MBA degree program at Penn.) ■

Veterinariae Medicinae Doctoris (V.M.D.) degree

It takes four years of graduate studies to earn a V.M.D. degree. The first two years are spent in lecture and laboratory, covering such basics as anatomy, biochemistry, physiology, embryology, pathology, and nutrition to lay the foundation for the clinical exposure in the third and fourth years. During the third year the students are increasingly exposed to clinical teaching and begin to have hands-on experience with animal patients. At the end of the third year each student selects one of five "tracks": Small Animal, Large Animal, Large and Small Mixed, Equine, or Food Animal. During the fourth year students experience clinical rotations consisting of six foundation and 18 elective blocks.

For students interested in both veterinary medicine and business, the school of Veterinary Medicine and Penn's Wharton School offer a combined course leading to the joint degrees of V.M.D. and M.B.A. This rigorous joint program involves five to six years of study. (There is also a M.B.A. program for graduated veterinarians; please see "Continuing Education Opportunities.") A six-to-seven year program of study leading to both a V.M.D. and Ph.D. degree is available for a small number of highly-motivated, highly-qualified students interested in in-depth research.