Veterinary Science: To The Year 2000 And Beyond

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It should not be surprising that the future objectives of the Department of Veterinary Science are little different than those committed to in 1890 when Dr. Theries Himebauch arrived in North Dakota as the first veterinarian on the faculty at the new North Dakota Agricultural College. Those objectives follow the true Land Grant tradition (1862) and the Hatch Act of 1887. Translated to North Dakota, it means that we are committed to making North Dakota the safest place in the world to raise livestock, through education of our young people, service to the industry through the Veterinary Diagonistic Laboratory, and through basic and applied research using the modern tools of biotechnology.

The teaching function in the department has a long tradition beginning before the turn of the 20th century. The teaching program has evolved through the years and now consists of several service courses in veterinary science and a veterinary technology program.

The vet. tech program is evolving from the traditional two-year associate degree program to a full four-year program, reflecting the changing expectations of both students and the veterinary profession. This evolution is on the leading edge of a national move to more appropriately educate veterinary technologists to a truly professional level. Demand for NDSU veterinary technical graduates has increased dramatically in recent years.

There is also an increase in the number of preprofessional students with preveterinary medical program. These students are at NDSU for three to four years before transferring to a veterinary college in a state with which North Dakota contracts. At the present time there are six such states.

The service/extension function of the department focuses on activities through the Veterinary Diagnostic Laboratory. Things have changed rather dramatically from the times in the early 1900s when Dr. Leunis Van Es maintained a laboratory in the basement of his home where he pursued his diagnostic medicine interests after hours. The diseases we direct our attention to now are different from those of earlier days but they are no less costly. Estimates that losses due to animal diseases account for 20 percent of the cost of production are probably conservative.

It is important to recognize that the activities of the Veterinary Diagnostic Laboratory often involve much more than the disease or diseases attributable to a single animal owner, farmer, or rancher. Public health concerns become all too apparent when we consider such diseases as rabies, brucellosis, salmonellosis, plague, or any of the other more than 100 diseases that can be transmitted from animals to man.

The laboratory is also always on the lookout for exotic, foreign animal diseases that could devastate animal populations not only in North Dakota but nationwide. These diseases range from the more familiar such as foot and mouth disease, bovine pleuropneumonia, African swine fever, and African horse sickness, to such diseases as onyong-nyong, chikungunya, akabane, Rift Valley fever, Cache Valley fever, rinderpest and on and on. It has been well stated that it is not "if" one or more of these diseases appear in North Dakota but "when." Upgrading diagnostic expertise and developing new, more sensitive diagnostic tests using molecular biological approaches such as recombinant DNA techniques and monoclonal antibodies are part of present programs and future objectives.

The aim, again, is to support the agricultural industry in North Dakota in recognizing and diagnosing diseases, in protecting the public from diseases transmissible from animals to man, identifying toxins, residues, and other substances in feed grains that could have broad implications for the grain industry as well as for animal and human populations, and the list goes on. A strong, viable Veterinary Diagnostic Laboratory is an essential component in successful, competitive, and profitable agriculture on into the 21st century.

Activities in diagnostic veterinary medicine provide material for very applied, targeted research projects. Examples of these include spider lamb disease, sweet clover poisoning treatment, mycotoxins in edible sunflowers and trichomonas infection in bulls. These same activities also provide information for treatment, prevention, control, and eradication of many disease problems. A final and very important consequence of diagnostic activity is in providing material for more basic types of research. Diagnostic veterinary medicine provides the grist for the research mill.

There is a very important area in diagnostic veterinary medicine that has been neglected and must be addressed as future goal. That is in the area of animal health and disease surveillance. It will only be through a systematic epidemiological approach that strategies can be developed to meaningfully control and/or eradicate disease problems.

Beth Kornelius works at a mass spectrometer in the toxicology laboratory. Used to identify organic materials, the spectrometer produces "fingerprints" of pesticides and other compounds.

It will also be a major step forward in identifying and understanding emerging and changing disease patterns. Such diseases as blue tongue, epizootic hemorrhagic disease, vesicular stomatitis, and bovine paratuberculosis are examples of these emerging and changing disease patterns.

The research program in the department has a long history of excellence beginning with Dr. Van Es's definitive work on equine infectious anemia and avian tuberculosis. It is continued with Drs. Schalk and Amidon's classical research on the physiology of the ruminant stomach. Dr. Roderick's work on sweet clover poisoning in the 1930s also cannot be passed over. This tradition has continued through the present and hangs as a star for the future. The focus will continue to be on approaches to providing the tools to the livestock industry of North Dakota for decreasing the costs of production due to animal disease.

These approaches for the near and distant future are different in some ways from those of 50-75 years ago and yet there are similarities. The explosion of new knowledge in areas such as immunology and virology has opened new avenues for the fundamental understanding of disease processes. This allows strategies to evolve for attacking these disease problems in ways not possible only a few years ago. Caution must be exercised, however, in not promising more than can be delivered. The euphoria over modern biotechnology often stimulates this. However, there are areas where the modern tools of biotechnology can be used to great benefit. Such technologies as recombinant DNA probes and monoclonal antibodies are already being used to understand disease processes that heretofore have been obscure. These techniques will take their rightful place in the development of new, more sensitive, and rapid diagnostic tests, more effective vaccines, and in new knowledge of the development of disease.

A research thrust in the area of immune modulation, or modification of the immune response, is underway in the department at the present time and is part of the wave of the future. Immunomodulating substances will have a profound effect on the approaches to treatment in such areas as organ transplants, viral and bacterial diseases, and cancer. These substances will be part of the answer to the adverse effects of some vaccines and of life threatening effects of chemotherapy.

It must be recognized that research in the future will cross disciplinary and departmental lines. This again is part of a legacy from the past since it was the same intent of the Hatch Act of 1887. Science wedded to opportunity are watchwords for our future.