

## Section V

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### Background Information

#### A. State Statistics

Animal agriculture is a vital part of Minnesota's economy. In 2001 (the most recent year for which data were available), cash receipts at the farm gate from livestock production totaled nearly \$4.3 billion, roughly 53% of the state's overall agricultural sales. The full economic impact of MN's livestock production exceeds \$10.7 billion when indirect and induced outputs are considered. In addition to being a major economic driver, livestock production is a major employer. The industry is credited with supporting nearly 100,000 jobs (directly providing nearly 28,000 jobs and creating business activity that supports 70,000 more).

Animal agriculture also generates significant demand for Minnesota's largest agricultural crops through animals' consumption of feed grains. MN's livestock annually consume roughly 20% of MN's corn and soybean crops. This local demand adds value to the crops. It is estimated that animal agriculture adds more than \$2 billion to the value of MN's crops. Unlike some states dominated by one species or business model, MN's animal agriculture industry is diversified in terms of livestock species, farm size, and business model. This diversity is important because it gives the industry resiliency and flexibility.

While MN's livestock industry is a major economic force, its future is uncertain. As input costs have increased and commodity prices have remained relatively static, profit margins for farmers have shrunk. This has driven some farmers out of business, while others have chosen to farm part-time and work off the farm to supplement their farm income. Some have chosen to switch to alternative farming methods such as organics, which offer potentially higher per-unit returns in exchange for higher production costs. For others, the answer has been to try to increase the number of acres or animals to offset the declining per-unit returns. As profit margins dwindle and business costs and family costs increase, farmers find they need to modernize and increase their efficiency simply to generate a livable income. However, attempts to expand or improve their facilities are sometimes met with resistance.

The state's dairy sector, once the crown jewel of MN agriculture, is leaving the state at an alarming rate. In the last 10 years, MN lost 173,000 dairy cows<sup>i</sup>, 21 dairy processing plants<sup>ii</sup> and hundreds of millions of dollars in related economic activity. While the short-term status of the pork, poultry and beef sectors appears more stable, there are concerns about their long-term competitive ability as well.

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#### U.S. State Agricultural Production Rankings: MN's Rank Among States

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1 <sup>st</sup>	Turkeys Raised	5 <sup>th</sup>	Milk Cows	7 <sup>th</sup>	Agricultural Exports
3 <sup>rd</sup>	Hogs and Pigs		Milk Production	8 <sup>th</sup>	Cash Receipts (livestock)
	American Cheese		Total Cheese	9 <sup>th</sup>	Eggs
			Ice Cream		
		6 <sup>th</sup>	Red Meat Production		

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*Reprinted with permission from the Minnesota Department of Agriculture. Governor Tim Pawlenty's Advisory Task Force (2004). Minnesota's Animal Agriculture Industry Executive Summary. Minnesota Department of Agriculture, St. Paul, MN.*

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<sup>i</sup> Minnesota Agricultural Statistics Service, 1993, 2003.

<sup>ii</sup> Dairy and Food Division, Minnesota Department of Agriculture.

## **B. University of Minnesota**

The University of Minnesota is one of the most comprehensive public universities in the United States and ranks among the most prestigious. It is both the state land-grant university, with a strong tradition of education and public service, and the state's primary research university, with faculty of national and international reputation.

The University of Minnesota was founded as a preparatory school in 1851, seven years before the territory of Minnesota became a state. Financial problems forced the school to close during the Civil War, but with the help of Minneapolis entrepreneur John Sargent Pillsbury, it reopened in 1867. Known as the father of the University, Pillsbury, who was a University regent, state senator, and governor, used his influence to establish the school as the official recipient of public support from the Morrill Land-Grant Acts, designating it as Minnesota's land-grant university.

The University of Minnesota, founded in the belief that people are enriched by understanding, is dedicated to the advancement of learning and the search for truth; to sharing knowledge through education for a diverse community; and to the application of this knowledge to benefit the people of the state, the nation, and the world. The University's mission, carried out on multiple campuses throughout the state, is threefold:

### **Research and Discovery**

Generate and preserve knowledge, understanding, and creativity by conducting high-quality research, scholarship, and artistic activity that benefit students, scholars, and communities across the state, the nation, and the world.

### **Teaching and Learning**

Share knowledge, understanding, and creativity by providing a broad range of educational programs in a strong and diverse community of learners and teachers, and prepare graduate, professional, and undergraduate students, as well as non-degree-seeking students interested in continuing education and lifelong learning, for active roles in a multi-racial and multi-cultural world.

### **Outreach and Public Service**

Extend, apply, and exchange knowledge between the University and society by applying scholarly expertise to community problems, by helping organizations and individuals respond to their changing environments, and by making the knowledge and resources created and preserved at the University accessible to the citizens of the state, the nation, and the world.

In all of its activities, the University strives to sustain an open exchange of ideas in an environment that embodies the values of academic freedom, responsibility, integrity, and cooperation; that provides an atmosphere of mutual respect, free from racism, sexism, and other forms of prejudice and intolerance; that assists individuals, institutions, and communities in responding to a continuously changing world; that is conscious of and responsive to the needs of the many communities it is committed to serving; that creates and supports partnerships within the University, with other educational systems and institutions, and with communities to achieve common goals; and that inspires, sets high expectations for, and empowers individuals within its community.

## **C. College of Agricultural, Food and Environmental Sciences**

The College of Agricultural, Food and Environmental Sciences is one of the oldest colleges within the University of Minnesota. In 1851, the territorial House of Representatives stated in its charter that an agriculture department was to be part of the University. The College of Agriculture convened its first classes in 1869 and has since been committed to serving the needs of the citizens of Minnesota.

The College's research and outreach missions are supported in part by the Minnesota Agricultural Experiment Station and the University of Minnesota Extension Service. Approximately one-half of

College faculty have joint appointments with Extension and receive research funding through the Experiment Station. Faculty and staff of the College work throughout the state, and around the world through the College's international programs. People within the College collaborate with countless scientists, educators and citizens to solve pressing problems from global warming and nutrient flow down the Mississippi River to the Gulf of Mexico to crop and horticultural diseases. World-class educational programs prepare thousands of national and international leaders to address the complexities of an increasingly global, diverse, and technological world.

Today, the College of Agricultural, Food and Environmental Sciences is consistently ranked among the top five colleges of agriculture in the world and is home to faculty and students who are recognized as global leaders in their fields. Providing access to a high quality education, helping citizens solve real-world problems and advance economically, preparing top-notch professionals to meet environmental, food and agricultural systems needs, and contributing to a broad public understanding regarding complex environmental, food and agricultural issues all remain core to the mission of the College.

In addition, the College's adoption of six strategic new priorities - *promoting safe and healthy foods, improving environmental quality, enhancing agricultural systems, revitalizing Minnesota's rural communities, and serving urban communities*, all bound by an overarching priority of *emphasizing exemplary education* - provide new recognition of the challenges facing the world and the importance of the College to address these critical state and global issues. The College's "*knowledge for a changing world*" is making significant contributions through the tripartite mission - teaching, research and extension - that has been a hallmark of the land grant college of agriculture system.

## **D. Department of Animal Science**

In 1893, Animal Husbandry became a separate division within the School of Agriculture. In 1894, the first course in dressing and curing meats in a U.S. or Canadian agricultural institution was offered. This course's success led to a new meat laboratory built in 1901. By 1905, there were four meats courses. Division Head, Andrew Boss's many achievements greatly increased interest in animal husbandry at the University. A cattle-breeding project with Milking Shorthorns was started and a new Livestock Pavilion for the Division was built in 1904. This building was considered one of the outstanding animal husbandry facilities in the U.S. The meat science laboratory was named the Andrew Boss Laboratory of Meat Science in 1977.

Peters Hall, built in 1950, housed the Divisions of Animal and Poultry Husbandry. In 1919, Clarence Eckles was appointed Chief, Division of Dairy Husbandry and maintained a staff of top teachers and scientists in the country. In 1936, J.B. Fitch became Division Head. Under his direction, Edward Graham performed world-renowned research to preserve sperm of all animal species. C.L. Cole, Dairy Husbandry Division Head (1956), holds the distinction of being the first person in America to successfully inseminate a cow resulting in a calf. In 1959, a Dairy Industry Department (now Department of Food Science and Nutrition) separated from the Department of Dairy Husbandry.

In 1966, the Divisions of Poultry Husbandry, Animal Husbandry, and Dairy Husbandry merged into one Department of Animal Science. Peters Hall became home of the administrative offices. C.L. Cole, Head until 1969, was succeeded by Professor Hueg, Acting Head for one year. R.W. Touchberry, Head in 1970, was succeeded by Dick Goodrich in 1981. Donald Otterby became Acting Head in 1994. F. Abel Ponce de León has been Head of the Department of Animal Science since July 1, 1997.

The swine and physiology groups moved from Peters Hall to the AS/VM building in 1993. The dairy group moved from Haecker Hall to Peters Hall in 1997 while Haecker Hall was being renovated. The renovated Haecker Hall became the home for the Department of Animal Science in September 1998 and now includes the administrative offices as well as dairy, beef and poultry faculty, students, staff, and teaching and research facilities.

The University of Minnesota's Department of Animal Science is a major national center for research, learning, teaching, and extension work in animal agriculture and animal biology. We are especially well-known for our leading-edge research in three priority areas: nutrition, growth

biology/physiology, and production systems. World-class science is our goal and standard of excellence in these broadly defined areas.

At the same time, we maintain excellence in the basic areas of undergraduate animal science, and our work with industry clientele and communities is marked by our proactive participation in resolving livestock issues across Minnesota. We build connections to our stakeholders — students, industry clientele, legislators, and the community — and interact with them in teaching and learning. Residents of the college, state, region, and nation recognize us as an essential component in major problem-solving for animal agriculture.

As we strive to balance and integrate our work in basic and applied science, we develop collaborative teams that bring a range of disciplines and perspectives to bear on critical agricultural and environmental issues. Effective teamwork represents our commitment to combining our knowledge and skills to serve our students and clients, and we are rewarded for that ability.

We have initiated marketing and recruiting to increase the number of students majoring in Animal Science programs. The Gourman Report rated the Animal Science undergraduate program as one of the top 10 (7th) in the United States. We have increased the level and quality of support for faculty and programs and have enhanced the relevance of our graduates by strengthening the Animal Science curriculum, focusing on developing students who take leadership roles in management and industry.

Our Department's goal, through education and research, is to serve people by providing continued improvements in the efficient and humane production of animals and wholesome animal products. As such, the education, research, and extension programs in the Department of Animal Science have a three-fold mission:

- To provide lifelong opportunities for learning about animal biology, management systems for domestic animals and the role of animals in a changing society.
- To seek new knowledge about the biology, production and care of domestic animals.
- To interpret research and provide education for producers and consumers of animal products to improve their economic well being and quality of life.

To carry out our mission, three academic specializations in Animal Science (nutrition, physiology and growth biology, and production systems) have formed multidisciplinary teams to work in subject areas. A broad spectrum of research, ranging from fundamental laboratory studies to farm-oriented applied projects is conducted.

Our current research areas include molecular, cellular, developmental, and growth biology; genetics (quantitative, molecular and functional); physiology and cell signaling; reproduction; nutrition (ruminant and non-ruminant); and production systems.

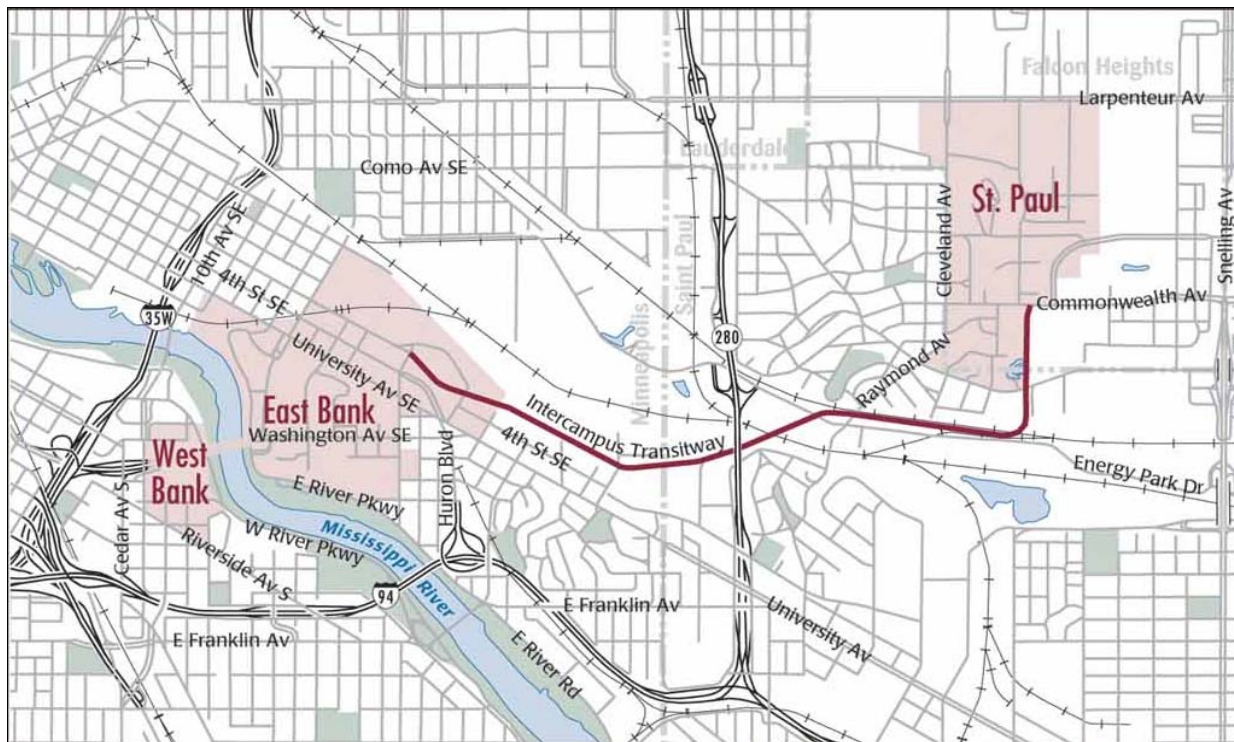
## **E. Facilities**

### **Campus**

The University of Minnesota - Twin Cities is located on three separate campuses within the Twin Cities metropolitan area. The three campuses are:

- **West Bank Campus**, located on the west side of the Mississippi River in Minneapolis, and housing the Carlson School of Management, Law, Geography, and many of the Arts;
- **East Bank Campus**, located on the east side of the Mississippi River in Minneapolis. This is the main campus and houses many of the basic sciences including the Academic Health Sciences, Liberal Arts, Engineering, Geology, and central administration; and
- **St. Paul Campus**, located in St. Paul, about five miles from the East Bank Campus. The St. Paul Campus houses the Colleges of Agricultural, Food, and Environmental Sciences; Natural Resources; Veterinary Medicine; Human Ecology; and Biological Sciences. The St. Paul Campus is surrounded by research fields and pastures, the State Fairgrounds, and the City of St. Anthony Park. A convenient, free shuttle bus service runs between the campuses, allowing individuals to get to one of

the other campuses within about 15 minutes during normal class times. Evening and weekend service is less frequent, but still reasonable.



Due to its location in the state capital, our department has strong affiliations with, and performs valuable service for, a variety of state agencies including the Departments of Agriculture, Health, and Natural Resources and the Pollution Control Agency.

### **Buildings**

The Department of Animal Science is housed in three buildings on the St. Paul Campus of the University of Minnesota. These buildings include the Andrew Boss Lab of Meat Science (ABMLS), Animal Science/Veterinary Medicine (AnSci/Vet Med) and Haecker Hall and contain offices for faculty, post-docs, graduate students and staff, wet and dry laboratories, cold rooms and freezers; storage areas; research facilities, lecture rooms and teaching laboratories and public spaces. The administrative offices are located in Haecker Hall. Research and teaching units for dairy and beef cattle, swine, sheep and poultry are located on the St. Paul Campus. Other herds and flocks are at the Agricultural Experiment Station Research and Outreach Centers at Crookston, Grand Rapids, Morris, Rosemount and Waseca, Minnesota.

The department has a large inventory of microcomputer equipment that includes microcomputers, printers, laser printers, scanners and plotters. Haecker Hall is home to our multimedia room that includes wireless networking, state-of-the art computing, telecommunications and presentation equipment.

### **Classrooms**

Classroom space at the University of Minnesota is controlled and allocated by Central Administration. DAS typically utilizes one or two common classrooms for large enrollment classes and is assigned classrooms for other courses.

### **Office Space**

Faculty, staff, and student offices are mainly located in Haecker Hall with additional space in AnSci/Vet Med and ABLMS. The department has adequate space for offices, though post-docs, staff, and graduate students typically share offices with one or more individuals. With a few exceptions, most of the offices are relatively comfortable and in reasonable condition. The offices in Andrew Boss Lab or Meat Science are generally in poorer condition and are in need of new furniture.

### **Laboratories**

Specialized laboratories for Animal Science faculty and graduate students in Haecker Hall, AnSci/Vet Med and ABLMS provide modern equipment to accommodate research in diverse areas, including genetic engineering, cell culture, cryopreservation of gametes and embryos, hormone assays, protein purification, in vitro fertilization, micro-manipulation and cloning embryos, forage and fiber analysis and in vitro fermentation and metabolism studies.

### **Student Spaces**

DAS has limited public space available; the library on the 3<sup>rd</sup> floor of Haecker Hall is one such space. This space is conveniently located by a kitchen space available for use by all DAS personnel. We have some conference rooms available for students to meet with faculty and student groups. Additionally, we grant space to student groups such as the Gopher Dairy Club and the Block and Bridle Club.

### **Animal Facilities**

The St. Paul campus has animal facilities on campus that support the University of Minnesota's tripartite mission of research and discovery, teaching and learning, and outreach and public service. The animal facilities are managed by a staff of five and an oversight faculty member. Per diem charges are assessed to researchers using animals. Animals used for teaching are supported by the teaching compact

### **Research and Outreach Centers**

The University has six Research and Outreach Centers (ROCs, formerly known as Experiment Stations). ROCs have resident faculty who perform research and outreach related to the mission of the ROC. Currently, each ROC has a Head and administrative/ clerical staff, maintenance staff, field hands, and technical staff. While the faculty are resident at the ROCs, their tenure homes are in departments. DAS has faculty at four of the ROCs.

#### ***North Central***

NCROC is located in Grand Rapids, MN, in an area dominated by forests and wetlands. DAS has one faculty member at this site, Dr. Cliff Lamb (beef). The main areas of research here are pastures and grazing, and beef cattle reproduction.

#### ***North West Research and Outreach Center***

NWROC is located in Crookston. DAS had one faculty member in dairy located here, however, that individual retired in 2002 and the position was not replaced. This ROC maintains a dairy herd. Extension programming in nutrition emphasizes problem solving and includes: feeding management schools, calf management workshops, water quality, feed intake of dairy cows, energy systems of the 2001 dairy NRC, maximizing corn silage in diets, forage quality for dairy cows, forage grazing management, pasture walks, and transition cow management.

### ***West Central Research and Outreach Center***

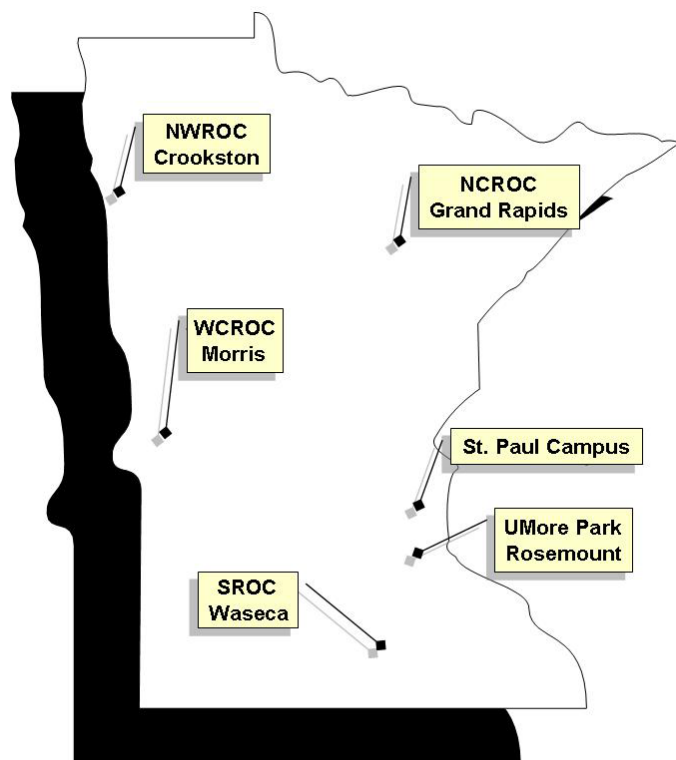
WCROC is located in Morris. The dominant crops in this region are corn and soybeans, and animal agriculture is common. DAS has two faculty at this ROC; Dr. Dennis Johnson (dairy) and Dr. Lee Johnston (swine). The grazing program has examined pasture renovation systems, evaluation of forages for grazing, seasonality of calving, and group rearing of calves. Dairy research at Morris is based on the need to identify reduced input systems that are effective for medium-sized dairy farms. The current objective at Morris is to conduct a 5-year study comparing conventional dairy management with a reduced-input dairy production system focused on seasonal production, intensive grazing, crossbreeding for hardiness, outdoor packed bedding, and value-added systems. Swine research includes evaluation of alternative swine housing systems and nutrition, and their impact on animal well-being. DAS also “hotels” a teaching flock of sheep at the WCROC.

### ***Southern Research and Outreach Center***

SROC is located in Waseca. DAS has three faculty members at this ROC, Dr. Sam Baidoo and Dr. Roger Walker (swine), Dr. Hugh Chester-Jones (dairy). Regarding swine, a relatively large, new sow research facility was constructed which provides an excellent resource for research and outreach programs. Research includes investigating the role of nutrition in reducing odor and gas emissions and nutrient excretion from swine manure. Regarding dairy, growing dairy heifers are now a focus at the Waseca ROC. A lactating herd of Holstein cows was eliminated in 2003, and new facilities for heifers were constructed. A unique partnership with industry and dairy producers provided financial assistance to permit the construction of the new facilities. An industry partner for heifer research is contracted for the next five years. There will now be sufficient heifer numbers to allow good statistical test power for numerous applied studies in nutrition and management of growing heifers.

### ***UMORE Park***

Formerly the Rosemount Experiment Station, UMore Park is a ROC located in the southern part of the metro region near Rosemount, MN in an area of encroaching urbanization. This location houses turkey research facilities for Drs. El Halawani and Noll. There are no resident faculty at UMore Park. Additionally, DAS “hotels” a small teaching and research beef herd at this location.



### **Libraries**

The University of Minnesota Libraries are one of the University's and the State's greatest intellectual and capital assets. Housed in five major facilities and eleven branch sites, the University Libraries are comprised of nearly six million print volumes, 45,000 serial subscriptions, 5.7 million microforms, 2.6 million government documents, and 400,000 maps, making it the 17th largest research library in North America. The Libraries employ 309 staff, 99 of whom are librarians, and it also circulates more than one million items annually to students, faculty, and staff.

## **Computational Resources**

The University of Minnesota has been a national leader in campus networking. DAS is fully networked, with nearly 200 computers linked to the campus Ethernet backbone. In addition, the University houses the Supercomputing Institute for Digital Simulation and Advanced Computation on the west bank campus. This facility, open to researchers on all campuses, currently provides supercomputing resource allocations and technical support for the IBM SP, IBM Power4 and Altix 3000 supercomputers as well as for a Linux Cluster supercomputer.

## **F. Other Significant Support**

### **Lecture Series**

#### ***W.E. Petersen Symposium***

Professor W.E. Petersen was a highly influential dairy scientist at the University of Minnesota in the mid-1900s. To honor his memory, Dr. Petersen's family established a fund in the Department of Animal Science to sponsor dairy-related symposia.

"Dairy Genomics– Future Trends and Opportunities" was the title of the first symposium held in December 2000. Invited to share their research work on the identification of chromosomal regions containing genes that control production traits were: Drs. Harris Lewin, University of Illinois; Yang Da, University of Minnesota; Curt Van Tassel and Melissa Ashwell, Research Geneticists, USDA; and Steve Kappes, National Program Leader, USDA. Researchers participated in discussions about progress being made on identifying genes directly responsible for important production traits.

The second bi-annual symposium "Reproductive Loss in Dairy Cows: Is the Trend Reversible?" addressed the decline of reproduction efficiency of dairy cattle on U.S. dairy farms and explored both biological and management factors that affect dairy reproduction. Five nationally known scientists – Drs. Matthew C. Lucy, University of Missouri; Marvin M. Pace, ABS, Global, Inc.; W. Ronald Butler, Cornell University; Jeffrey S. Stevenson, Kansas State University; and Leslie B. Hansen, University of Minnesota – presented their views and debated on the decline of fertility of cows. Attendance at this symposium was over 200 (double in number from the first symposium).

A third symposium is currently in the planning stages for spring 2005. The proposed topic is Dairy Farming System Options.

#### ***11th North American Colloquium on Domestic Animal Cytogenetics and Gene Mapping***

In June 1999, the Department of Animal Science co-sponsored the 11th North American Colloquium on Domestic Animal Cytogenetics and Gene Mapping. The international colloquium brought together scientists from around the world to share their research in farm animal genome mapping. The laboratories of these scientists have been involved in the development of standard domestic animal karyotypes based on chromosome banding technology. Invited speakers were: Drs. Craig W. Beattie, University of Nevada-Reno, Daniel Gallagher, Texas A&M University; Elaine Ostrander, University of Washington; Jose Cibelli, Michigan State University; Alain Vignal, Institut National de la Recherche Agronomique, Centre INRA de Toulouse, France; Martine Yerle, Institut National de la Recherche Agronomique, Laboratoire de Genetique, France; Hiroshi Yasue, University of Tsukuba, Japan; and Ernest Retzel and Ronald Phillips, University of Minnesota.

#### ***Department of Animal Science Seminars***

Departmental seminars are scheduled throughout the academic year. Presentations are given by invited speakers, faculty and graduate students. Animal Science graduate students are required to give a seminar once each year and expected to attend 75% of the seminars each semester. M.S. students are expected to present a departmental seminar during their course of study. A departmental seminar is required in conjunction with the final examination for Ph.D. students.

## **The Renovation of Haecker Hall**

Constructed in 1923, Haecker Hall was the last of three buildings designed by Clarence Johnston that form the identifiable front of the St. Paul Campus. Originally built as the Dairy Building, it was dedicated in the name of Theophilus L. Haecker who had served for 27 years as the chief of the division of dairy husbandry and animal nutrition. In the mid-1990's, Haecker Hall was selected to be renovated to become the main administrative offices of the Department of Animal Science as well as support the teaching, research and outreach functions of the genetics, poultry and ruminant units of the department.

The architects were charged with maintaining the building's exterior appearance while making the changes inside to allow for new laboratory and office uses that complied with current building codes. To accomplish this, the building was stripped inside to the structural frame and carefully reconstructed. The preservation of the exterior earned the building an award from the Preservation Alliance of Minnesota, which recognizes preservation of a variety of public and private buildings. It is the first University building to be awarded this honor by the organization.

Upon completion of the renovation, Haecker Hall gained an elevator, two additional exit stairwells, pairs of accessible restrooms on each floor, air handlers and air conditioning, adequate electrical power, improved lighting, a fire suppression system and a modern telecommunications system. In addition, the building was equipped with state-of-the-art research laboratories, a multimedia lab, and modern offices.

Haecker Hall, the new home to the Department of Animal Science, was re-dedicated on March 12, 1999.

## **Dedicated Rooms**

### ***The Richard D. Goodrich Multimedia Room***

When Haecker Hall was renovated, a multimedia room was incorporated into the design. This resource has many features that have added greatly to our ability to deliver quality programming and coursework. Built into the multimedia room are interactive television (ITV) capabilities through the University's Video Networking System (VNS). The ITV allows us not only to deliver programming to the coordinate campuses, extension offices, and outreach centers, but it also allows us to connect with many locations across the globe. Along with ITV, this room has a wireless networking hub and wired ethernet connections that allow users to access the internet. The room has also been designed with network expandability by having dozens of etherjacks located in floor receptacles throughout the room. These allow us to create a computer lab environment for teaching by having these connections activated. In addition to networking capabilities, we are able to show video tapes, DVDs and other presentations, and we can video tape events in this room. Through the ITV system, we can also transmit presentations to remote locations in real-time, live mode during our program delivery. Furthermore, we have a desktop computer integrated into the multimedia system, and an LCD projector and two televisions on which to display presentations and other media. The room itself may be configured many different ways to allow seating that fits with the needs of our users. Overall use of this resource has been phenomenal, and it continues to be a huge asset to the department.

The multimedia lab, Room 365 Haecker Hall, was dedicated to Dr. Richard D. Goodrich who served as head of the Department of Animal Science from 1983 to 1994. Dr. Goodrich was nationally known for his research in beef and dairy cattle nutrition and had close ties to Minnesota's livestock industry.

### ***The Robert N. Shoffner Library***

The Robert N. Shoffner Library, Room 375 Haecker Hall, contains a collection of agriculture-related books, journals, and magazines. The room also holds bound copies of Animal Science student theses. The library was dedicated to Dr. Robert N. Shoffner in recognition of his work in poultry genetics.

### ***The Robert W. Touchberry Conference Room***

The Robert W. Touchberry Conference Room (265G Haecker Hall) is used primarily by the Department's Genetics Group for research discussions and genetics-related meetings. The room was dedicated to Dr. Robert W. Touchberry for his research work in dairy genetics and service to the Department of Animal Science as head (1970-1981).

### ***Minnesota Livestock Breeders Hall of Fame***

The Minnesota Livestock Breeders Hall of Fame was started in 1934 to honor those making a significant contribution to the Minnesota livestock industry. An awards ceremony for the inductees is held each spring during the Livestock Breeders Annual Meeting and Banquet. Inductees are presented with a plaque and their portraits are hung in the Hall of Fame. DAS has been home to the Hall of Fame for several years – originally housed in the Livestock Pavilion and then relocated to Peters Hall in approximately 1951. When Haecker Hall was renovated in the late 1990's, the foyer on the main floor was designed especially for Minnesota Livestock Breeders Hall of Fame.

### ***Animal Breeding/Genetics Group Computer Laboratory***

Room 280 was designed for the animal breeding/genetics group during the Haecker Hall renovation. The lab is equipped with desktop computers, a projector and screen. The room is used by animal breeding/genetics graduate students and a graduate level course meets there.

### **DAS Internal Support**

DAS has allocated non-recurring internal funds to faculty members through an RFP process to enhance the missions of teaching, research and extension by providing an incentive to promote interactions among faculty. Funds have been allocated as follows:

2000	Research	\$30,000
	Teaching	\$15,000
	Extension	\$40,000
2001	Research	\$20,000
	Teaching	\$15,000
	Teaching Laboratory Equipment	\$17,100
2002	Research Laboratory Equipment	\$1,500
2003	Research Laboratory Equipment	\$37,482

Additionally, DAS has financially supported major equipment replacement and renovations in the farm animal facilities. Examples include heaters at the UMore Park Turkey facility and an improved feeding system at the St. Paul Dairy Facility. The Department provided matching funds to upgrade obsolete computer equipment and software for faculty and key support personnel. Office furniture and cubicles have been provided for the 4<sup>th</sup> floor of the AnSc/VM building.

### **Web Sites**

#### ***Swine Nutrition: A Web-based Curriculum for Distance Education in the Pork Industry***

A Web-based Swine Nutrition course was successfully developed in 2000 for traditional University of Minnesota students as well as non-traditional students. The course is offered to veterinary practitioners, extension educators, feed industry professionals, and owners, managers and employees of pork production operations. This applied course is intended for individuals who want to improve their knowledge and skills related to key swine nutrition and management concepts and become capable of developing, managing and evaluating life cycle feeding programs for swine. The course utilizes lectures, discussions, and problem-solving exercises that focus on swine nutrition, and managing and evaluating key life cycle feeding programs for swine.

**DDGS (Distillers Dried Grains with Solubles) Web Site** (<http://www.ddgs.umn.edu>)

The ethanol industry is one of the most rapidly growing agricultural industries in the U.S. Currently, dry mill ethanol plants produce over 3.8 million metric tonnes of DDGS annually. Industry experts predict that the volume of DDGS produced will increase to over 5.5 million metric tonnes by the year 2005. Because of the large supply of DDGS available to the feed and livestock industry, researchers at several Land Grant Universities have been conducting experiments to evaluate the nutritional value of DDGS in order to develop feeding recommendations for dairy, beef, swine, and poultry. The Department of Animal Science swine group is recognized internationally as the leader in DDGS research for swine.

In 2001, the Department of Animal Science swine group developed the University of Minnesota DDGS web site to serve as a collection point for research results and educational materials related to feeding DDGS in livestock and poultry diets. The web site also provides links to marketing groups and additional resources related to DDGS and the ethanol industry.

**Poultry Web Site** (<http://www.ansci.umn.edu/poultry/>)

The Department of Animal Science Poultry web site is comprised of three main sections: Extension, Teaching, and Research. The Extension section of the Poultry Web site provides links to on-line factsheets covering a wide variety of poultry-related topics. The site is a valuable resource for commercial producers, small-scale producers, youth and consumers alike. The Teaching section provides links to Animal Science graduate and undergraduate programs, poultry courses, resources for poultry students including an overview of the poultry industry, history of the poultry industry, and career opportunities in the poultry industry. The Research section includes links to poultry-related research projects at the University of Minnesota. In addition, the site is used to post biosecurity alerts throughout the year to inform and update users on the status of current poultry disease outbreaks.

**Animal Biotechnology Center** (<http://abcenter.coafes.umn.edu/>)

Animal Biotechnology Center's (AB Center) mission is to create and disseminate biological knowledge for the benefit of animals and humans.

The specific goal is to provide leadership in science-based improvement of animal well-being, safety of human food, and animal contributions to human health, by fully capitalizing on competitive advantages in microbial genomics, comparative and functional animal genomics, modulation of animal growth, tissue and organ engineering and reproductive technologies research by faculty in departments and colleges across the University.

The purpose is to benefit Minnesotans through discovery of mechanisms and processes that enhance animal health, improve disease resistance, translate into sustainable production of a safe and healthy food supply, and create advanced technologies for human medicine.

The AB Center supports faculty in reaching their objectives through the following long-term goals:

- Provide infrastructure and facilitate interdisciplinary research in animal biology, health and production.
- Provide a resource center for development and delivery of instructional and outreach programs in animal biotechnology.
- Promote and facilitate technology transfer and interactions with agribusiness.
- Increase effectiveness of faculty and staff recruitment in animal biotechnology.

**Examples of recent events and activities include:**

- Fall Symposium on Applied Genomics (September 14, 2003).
- Bioinformatics workshop (December 11th, 2003).
- Molecular BioTechnology Workshop, (July 14-18, 2004).
- 2nd Annual Meeting on Transposition and Animal Biotechnology (June 1-2, 2004).
- Bioinformatics equipment acquisition.

## **Database Development**

### ***Minnesota Animal Genome and Ontology Database (MANGOdb)***

The Minnesota Animal Genome and Ontology database (MANGOdb) contains an exhaustive laboratory information management system (LIMS) for storing data about such diverse topics as animal pedigrees and treatment, tissue and nucleic acid isolation, library production and sequencing, contig building and annotation, genetic and physical mapping, and macro and microarray hybridization. Central to the database is the ability to store comparative and gene ontology data gleaned from multiple external databases. An internet “shopping cart” based interface has been developed to allow users to assemble sequences into working sets to be analyzed by a suite of Molecular Genetics tools.

The following software tools have been posted at the Animal Biotechnology Center Bioinformatics website: <http://primer.ansci.umn.edu/bioinf.htm>. These tools make use of our comparative and functional genomics database for assembling jobs for sequence analysis and annotation:

- Sequencer Pipeline
- SeqCart
- GenBank Submission Pipeline
- Chromat Analyzer
- Primer3
- Overgo4.0
- Sequence Concatenation
- OrthoMap
- BLAST
- BLAT
- PolyView
- ChromatAnnotator
- Pairwise SEQALIGN

### ***Computing Resources***

The Animal Biotechnology Center Bioinformatics computer resources include a recently purchased Dell PowerEdge 2600 server with dual 3.0 GH Dual Intel Xeon processors, 4 GB memory and 546 GB hard-drive. For database development purposes the lab maintains a Dell PowerEdge 800 with 1.8 GH Intel Pentium 3, and 530 GB IDE Hard drive. Both machines use Linux Redhat 9 and MySQL.