Department of Animal Sciences

Annual Report

2008-2009
# ANNUAL REPORT
DEPARTMENT OF ANIMAL SCIENCES
Prepared: July 2009
Academic Year, July 1, 2008 – June 30, 2009
Research and Outreach, January-December (CY2008)

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<td>underrepresented groups among students, staff, and faculty</td>
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<td>3. Strategical planning unit has undertaken to address the NDSU</td>
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<td>Strategic Plan of Diversity</td>
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I. GOALS/ACCOMPLISHMENTS

The mission of the Department of Animal Sciences is to conduct research, education, and extension to improve the efficiency and profitability of livestock agriculture. In fulfilling this mission the Department of Animal Sciences is committed to:

- Scholarly inquiry in basic and applied sciences as a foundation for the department’s instructional and service functions, and to enhance the efficiency and profitability of North Dakota’s animal agriculture industry;
- Education of undergraduate and graduate students by providing both specialized knowledge and educational breadth in animal agriculture, animal science, and supporting disciplines;
- Effective and timely transfer of research-generated knowledge and technology to the agricultural industry and the larger scientific and public sectors to benefit the state, the nation, and the world.

Although teaching, research, and extension are individually and equally important, each enhances the others. The maintenance of strong linkages among these three components is basic to the effective operation of the Department of Animal Sciences.

A. Instruction and Student Success

1. Teaching initiatives and innovations

The department offers options of study in Animal Science Production/Business, Animal Science, Equine Studies and Veterinary Technology leading to a B.S. degree. In addition, M.S. and Ph.D. degrees are offered in Animal Sciences with various emphases available. Department faculty also advises numerous students who are attempting to meet the requirements for admission to a College of Veterinary Medicine.

Dr. Eric Berg established on-the-job occupational education at the NDSU Meats Laboratory. An undergraduate, student labor, on-the-job meat-processing education curriculum was established. Students were able to register for 1-credit, hours arranged for advanced training in red-meat slaughter and processing. Three sections were created for Pork, Lamb, and Beef (1-credit hour each).

Dr. Erika Berg created five new courses, three of which relate to therapeutic horsemanship; horsemanship instruction and equine anatomy and physiology are covered in the remaining two courses. In addition, a new trial course titled “Graduate Experience Program” was created, and a proposal for a minor in therapeutic horsemanship was initiated.

Dr. Carrie Hammer created and taught a new course in equine nutrition.

Extensive efforts to revise the animal science curriculum and options were begun, including a faculty retreat at the Alumni Center.
Members of the faculty in Animal Sciences make extensive use of Microsoft PowerPoint in presenting lecture information in courses. Most also use the Web (Blackboard) for placement of syllabi, course material, and readings.

2. Advising initiatives and innovations

With a total of around 310 undergraduate students and 26 graduate students, departmental faculty members are actively engaged in undergraduate and graduate advising. Advising not only consists of course scheduling and academic program tracking, but career planning and professional development as well. Numerous faculty serve as major advisors to graduate students and most faculty serve on graduate committees for students within and outside the department. Senior exit interviews generally praised advisors in the department for their care of students and knowledge of the necessary rules and regulations. In addition to academic advising, faculty and staff serve as advisors to various clubs (Saddle and Sirloin, Dairy Club, Equine Club, Veterinary Technology Club) and other activities (Academic Quadrathlon, undergraduate research).

3. Curriculum development including new programs, deletion of programs, administrative changes

Extensive efforts to revise the animal science curriculum and options were begun, including a faculty retreat at the Alumni Center. Formal approval of the revisions will be sought in the 2009-2010 academic year.

4. Accreditation or other reviews

The Veterinary Technology Program has full accreditation status by the Committee on Veterinary Technician Education and Activities (CVTEA) of the American Veterinary Medical Association.

5. Activities in student recruitment/retention, enrollment management, and other student activities

Much of the recruiting efforts are conducted by the individual faculty in the department such as at “Little I” activities, Youth Range Camp, 4-H Horse Camp, etc. We have the good fortune of having numerous faculty and staff who understand the need for being active recruiters at all times. Additionally, we contact all students indicating an interest in our programs who are on the distributed prospective student lists, and members of the department have participated in judging at science fairs.

Students participate in numerous organizations including Saddle and Sirloin (largest student club on campus), Equine Club, and the Dairy Club. These activities are highly important in teaching students leadership skills. Numerous students take part in the research programs in the department.

6. Distance education (including on-line) progress
Summary of Distance Education Activity

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Location provided</th>
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<tbody>
<tr>
<td>ANSC 463</td>
<td>Physiology of Reproduction</td>
<td>Dickinson State University</td>
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<tr>
<td>SAFE 407</td>
<td>Food Safety Risk Management</td>
<td>On-line</td>
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7. Assessment

The Animal Sciences Department has approached assessment efforts through a number of avenues. Regular faculty meetings throughout the year address assessment of student learning. Electronic mailings and handouts provided by the Director of University Assessment have been circulated to faculty with the intent of strengthening awareness of good assessment practices. The mentoring committees for new faculty members continue to emphasis the need for proper documentation of assessment in teaching portfolios to enhance success during the promotion and tenure process. We continue to develop assessment and to improve upon the manner at which we assess our courses in Animal Sciences.

The Department continues to provide students a variety of learning opportunities within the classroom as well as a wide variety of extracurricular organizations and activities. A high percentage of our majors participate in activities of the Saddle and Sirloin Club, Judging Club, Dairy Club, Equine Club, and Vet Tech Club.

B. Research/Creative Activity

1. Research and creative activities

Summary of Research and Scholarly Accomplishments – 2008

<table>
<thead>
<tr>
<th>Grants</th>
<th>Submitted</th>
<th>Funded</th>
<th>Pending</th>
<th>Not funded</th>
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<td>Number</td>
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<td>46</td>
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<td>32</td>
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<tr>
<td>Dollars</td>
<td>$26,904,563</td>
<td>$3,828,894</td>
<td>$8,684,460</td>
<td>$14,391,209</td>
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Publications

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<th>Journal Articles</th>
<th>Books and Book Chapters</th>
<th>Proceedings</th>
<th>Abstracts</th>
<th>Department Reports</th>
<th>Extension</th>
<th>Popular Articles</th>
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<td>33</td>
<td>6</td>
<td>20</td>
<td>62</td>
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Graduate Research Assistants

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<tr>
<th>Current</th>
<th>Graduated</th>
<th>Accepted</th>
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<tr>
<td>Number</td>
<td>21</td>
<td>8</td>
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2. Grants/Contracts

**Grants/Contracts (Includes Research, Extension and Instruction Grants)**

**Proposals funded**

Bauer, M.L. Effect of Monensin on Ruminal Sulfur Reduction. Dakota Gold Research Foundation. $5,000.


Berg, E. L. Instructional Development Grant for ANSC 364 Equine Anatomy and Physiology. NDSU University Senate Faculty Development Committee. $3,000.

Berg, P., North Dakota Beef Commission “Educating North Dakota beef producers on market potential of New Age Beef Value Cuts” $25,000

Berg, P., North Dakota Beef Commission, $1000, Meat Judging Team Competitive Scholarship


Maddock Carlin, K.R. (PI). Impact of oxidation on susceptibility of skeletal muscle myofibrillar protein cleavage by calpain I. ND INBRE. $8,000.

A. Grazul-Bilska (Co-Project Director). United States Department of Agriculture, CSREES/NRI, “Expression and methylation status of genes regulating placental angiogenesis in normal, cloned, IVF and monoparental sheep fetuses”, 2007-01215; $252,000 direct cost, ($315,000 total cost).

A. Grazul-Bilska (PI). Plastic Surgery Institute research grant “Study of aloe vera effects on the antioxidant system using 3D human skin EpiDerm™ model: Implications for skin protection and wound healing”. $5,000; 2007-2010.

A. Grazul-Bilska (PI). Center for Protease Research, NIH-COBRE and ND-INBRE seed grant (PI), “Interactions between the matrix metalloproteinase (MMP) system and gap junctions (GJ) in skin fibroblasts”. $8,000; 2008-2009.


Park, C.S., PI: Canola oil and breast cancer risk; USDA-CSREES; $28,500; 06/01/08-05/31/09.

Park, C.S., PI: Lipotropes and epigenetics; Morris Animal Foundation; $8,100. 10/01/08-09/30/09.

Park, C.S., PI: Methyl nutrients and mammary cancer risk; DOD-Medical Research Program; $120,000; 03/01/09-02/28/10.


Reynolds, L.P., Co-recipient (one of numerous Co-Investigators), NSF-INBRE Grant, “IdeA Networks for Biomedical Research Excellence” – Director, Cell Biology Core Laboratory, and Mentor, “Effect of MCPA, 2,4-D and bromoxynil on lung development (Dr. Hilde van Gijssel); $174,675 total direct costs, August 2004-May 2009

Reynolds, L.P., Co-Mentor, USDA, NRI Competitive Research Grant Proposal, Postdoctoral proposal – NOW CONVERTED to seed grant (Kasey Maddock Carlin) – “Effects of maternal nutrition and selenium status on postnatal muscle growth and meat quality;” $125,000 total direct costs; 1 Sept 2006 – 31 August 2008


Reynolds, L.P., Co-recipient (Role: Mentor for one Junior Investigator – Dorsam), NIH (COBRE) program, “New Strategies for Targeting Proteases in Disease,” P20 RR-015566, Sibi (Pl), $17,600, 7/1/07-6/30/12.

Stoltenow, CL., Extension Disaster Education Network (EDEN) Regional International Animal Agrosecurity Conference grant $25,000, 2008-2009


Wagner, S.A. (Project Director/Principal Investigator, NDSU) and Rushen, J.P. (Co-Principal Investigator, Agriculture and Agri-Food Canada), “Development of Quantitative Methods of Evaluating Analgesic Drug Efficacy In Lame Dairy Cows” USDA CSREES National Research Initiative, $99,954.

Wagner, S. A. and Hill, E. P. “Portable Computer Lab for the Veterinary Technology Program”
Technology Fee Advisory Committee, North Dakota State University $3,000

Wagner, S. A. and Hill, E. P. “Review course for veterinary technology students preparing for the national licensing examination” Board of Trustees Endowment Fund, North Dakota State University Development Foundation, $618

J.S. Luther (PI) and C. Saevre. Application of Reproductive Management Techniques to the U.S. Sheep and Goat Industries. American Sheep and Goat Center - $30,021.

J.S. Luther (PI) and J.S. Caton. Effects of Rumen By-Pass Arginine Supplementation on Reproductive Performance in Sheep. Ridley Block Operations and SODA-Products - $21,928.

J.S. Luther (PI), G. Lardy, C.S. Schauer, E. Loe, M. Stamm and T. Paterson. Overcoming Challenges Associated with Natural Lamb and Beef Production. USDA Four-State Ruminant Consortium - $102,000.

Proposals submitted with decisions pending


Berg, Eric and Vonnahme (Co-PI), Use of young female gilts as a biomedical model of human females to determine if consumption of beef from cattle administered estrogenic growth promotants results in premature puberty and obesity. ND Beef Commission. 1/14/09. Requested $39,100; granted $30,000.

Berg, Eric and Anderson, Vern (Co-PI), What components of peas improves tenderness in beef muscle? Co-PI with Vern Anderson. Submitted to USDA/CSREES 12/02/08. $58,570


Park, C.S., PI: Canola oil and breast cancer cell death; American Institute for Cancer Research; $175,000; 10/01/09-09/31/11.
Park, C.S., PI: Dietary methyl nutrients and mammary cell growth and death; NIH; $143,000; 12/01/09-11/30/11.

Reynolds LP, (Project Director), Redmer DA (PI – Laboratory Core Facility), Caton JS (PI – Animal Core Facility); 4 Junior Investigator’s, Center for Developmental Programming, NIH-COBRE, $8M TDC, $11.1M TC. Submitted April 28, 2009.

Reynolds, L.P., Collaborator on various proposals from ARS Dept. (Luther, Vonnahme, Grazul-Bilska), Biology Dept. (Reed), Chem/Biochem. Dept. (Dorsam), Pharm. Sciences (O’Rourke) NDSU, and also Science Dept., Valley City State Univ. (vonGjissel) to NIH, USDA, Amer. Cancer Soc., and Amer. Heart Assoc., $30,000.


Extension Disaster Education Network (EDEN) eXtension Communities of Practice, Agrosecurity and Flooding, $26,000, Stoltenow, CL and Hellevang, KJ, 2008-2009.

**Proposals submitted but not funded**


Berg, E., A novel feeding strategy for swine that re-evaluates the concept of compensatory gain. Submitted to National Pork Board 11/25/08. $16,166.


Berg, E., Swine education and scholarship program to support undergraduates to pursue advanced degrees in swine science/studies. Submitted to North Central Region: Sustainable Agriculture Research and Education. Requesting $150,000 over three years. Submitted 5/08.

Caton, J., Reed, J., and Berg, E., Effects of maternal nutrient restriction and postnatal selenium supply on intestinal growth, vascularity, and function. Submitted to USDA-NRI 06/08.


A. Grazul-Bilska and J. Caton. USDA-NRI. Effects of nutrition on oocyte quality. Total Requested. $349,949

A. Grazul-Bilska and J. Caton. NIH., Nutritional effects on oocyte quality. Total Request. $741,290

NIH COBRE: L. R. Reynolds overall PD, J. S. Caton, Animal Core PD, D. A. Redmer, Laboratory Core PD., Center for Developmental Programming; Total request $11,072,101

J. Reed and J. Caton, Effects of Maternal Nutrient Restriction and Postnatal Selenium Supply on Intestinal Growth, Vascularity, and Function. USDA-NRI. $348,196

T. Colville, Professional Development Grant from North Dakota State University President’s Office, $1,000.00.


Greg P. Lardy, Co-PI's Bryan W. Neville and Christopher S. Schauer. Influence of thiamin level on ADG, G:F, carcass characteristics, and incidence of PEM in feedlot lambs fed 60% distillers grains in finishing rations. SBARE Gas Tax Corn Committee. $9,583. One Year.


Greg P. Lardy, Co-PI's Bryan W. Neville, Christopher S. Schauer, Rob Maddock. Influence of increasing level of corn dried distillers grains plus solubles on lamb performance, carcass traits, and taste panel acceptability. SBARE Gas Tax Corn Committee. $7,866. One Year.
Greg P. Lardy, Co-PI's Bryan W. Neville, Christopher S. Schauer, Rob Maddock. Influence of increasing level of corn dried distillers grains plus solubles on lamb performance, carcass traits, and taste panel acceptability. North Dakota Corn Utilization Council. $7,866. One Year.

Greg Lardy. Effects of corn condensed distillers solubles supplementation on performance, ruminal fermentation, and digestion in cows consuming low quality forages. SBARE Gas Tax Corn Committee. $30,185. One Year.


Park, C.S., PI: Canola oil and mammary cancer; Komen Foundation; $170,000.

Park, C.S., PI: Compensatory nutrition and epigenetic control of mammary gene expression; USDA; $320,000.

J.W. Schroeder and Chester-Jones, H. 2009-2010. Optimizing Dry Field Peas in Diets for Pre-weaned Dairy Replacements. Cool Season Food Legumes (CSFL) research through the USDA-Cooperative State Research, Education, and Extension Services (CSREES). $34,067, 90%.


K.A. Vonnahme, The role of the kallikrein-kinin system in the utero-placenta throughout pregnancy. Submitted to NIH-RO3. PI. $150,000.


Other funding not included above


Berg, P. Coordinator and Faculty Advisor to Carnivore Catering (Approximately 75 events &
$50,000 net income.


Park, C.S., PI: Calf immune study; Land O’ Lakes, Inc.; $8,000 equivalent nursing formula; 06/01/08-05/31/09.

Active Research Projects

E. Berg. Stress factors of farm animals and their effects on performance.


E. Berg with Co-PI, Kasey Carlin. Evaluation of the physiological response of feedlot cattle to working chute environment relative to temperament, growth rate, carcass composition, beef quality, and tenderness. ND Beef Commission funded till Nov. 30, 2009. $64,574.

E.Berg with Co-PIs, Paul Berg and Travis Maddock. Assess the Effectiveness of Oxygen (O2) Barrier Oven Bags in Low Temperature Cooking on Reduction of Warmed Over Flavor (WOF) in Beef Roasts. ND Beef Commission funded till Nov. 30, 2009. $32,740.

P.T. Berg, Minimal Management Sheep Production – CRIS report from the Hettinger Research Extension Center (Co PI with Chris Schauer)


Danielson, R., Coordination of Beef-Sim (production/economic simulation program for beef producers) modeling program as a part of the ND Beef Systems Center of Excellence Project.

Co-Project Director; USDA, NRICGP, “Expression and methylation status of genes regulating placental angiogenesis in normal, cloned, IVF and monoparental sheep fetuses”, 2007-01215;
Grazul-Bilska, A., Principal Investigator; Plastic Surgery Institute research grant “Study of *aloe vera* effects on the antioxidant system using 3D human skin EpiDerm™ model: Implications for skin protection and wound healing”. $5,000; 2007-2009.

Grazul-Bilska, A., Principal investigator. Center for Protease Research, NIH-COBRE and ND-INBRE seed grant (PI), “Interactions between the matrix metalloproteinase (MMP) system and gap junctions (GJ) in skin fibroblasts”. $8,000; 2008-2009.

Grazul-Bilska, A., Principal investigator. ND-EPSCoR Small Award (PI), “Interactions between the matrix metalloproteinase (MMP) system and gap junctions (GJ) in skin fibroblasts”. $1,500, 2008-2009.

Grazul-Bilska, A., Principal investigator. Office of Dean of College of Agriculture, Food Systems and Natural Resources, small grant (PI), “Interactions between the matrix metalloproteinase (MMP) system and gap junctions (GJ) in skin fibroblasts”. $1,500, 2008-2009.


G. Lardy, Supplementation Strategies to Improve Cow-calf production efficiency and profitability.

G. Lardy(PI), P. Berg, R. Maddock, K. Maddock-Carlin (Co-PIs), Beef Systems Center of Excellence.

J.S. Luther (PI) and J.D. Kirsch. Impact of commercially available PG600 versus PMSG on fertility in ewes subjected to LAI. Funds Generated from the North Dakota Sheep AI and Semen Collection Project. April, 2006 to February, 2012.

L. Lekatz, K. Vonnahme, J.S. Luther (PI). Effects of maternal undernutrition and high selenium during gestation on umbilical blood flows throughout pregnancy in sheep. Animal work currently being done. USDA funded project.


Maddock, R.J., Hatch Project ND01718 “The Impact of Micronutrients on Meat Quality and Safety” originally submitted by Mary Marchello was taken over by me. This project expires in 2008. I am writing a new Hatch project which will focus on the relationship between animal
health and meat quality.

Maddock, R.J., Affect of backgrounding rate of gain on meat quality. Feedlot cattle were grown at two different rates of gain during backgrounding and followed to slaughter. All data are collected and Beth Stoltenow completed her thesis.

Maddock, R.J., Coordinate Taste Panel. A taste panel was trained and is currently being used to evaluate meat from several research projects.

Maddock, R.J., Field Peas and Meat Quality. Evaluating the addition of field peas to beef diets on meat quality. Data and meat samples were collected and are being evaluated for shear force and palatability traits.

Maddock, R.J., Cull Cow Quality. Collected carcass data from cull cows fed various levels and types of supplements. From a Four-State Consortium Project at SDSU and Univ. of Wyo.

Maddock, R.J., Glycerol in Finishing Diets. Collected carcass data and conducted statistical analysis on the effect of glycerol (a byproduct of biodiesel production) on beef quality. Research was initiated and conducted at CREC.

Maddock, R.J., Natural vs Conventional Beef Production. Galbreath thesis project was completed investigating the difference between “natural” and “conventional” beef production systems. Project involved HREC, CREC, and NDSU.

Maddock, R.J., Distillers Grains in Beef Finishing Diets. Collected carcass data and meat samples for Leupp dissertation project.

Park, C.S. (PI), Lactation Study, Hatch, 10/01/05-09/30/10.

Park, C.S. (PI), Canola Study, USDA-CSREES, 06/01/07-05/31/09.

Park, C.S. (PI), Methyl Nutrient Study, Morris Animal Foundation, 10/01/08-09/30/09.

Park, C.S. (PI), Role of Compensatory Growth in Epigenetic Control of Mammary Gene Expression and Lactation, USDA-CSREES, 10/01/07-09/30/08.


L.P. Reynolds, D.A. Redmer(Up-PDs), USDA CSREES Hatch Project ND01727. Angiogenesis

L.P. Reynolds, Co-Principal Investigator, Hatch ND01705, “Reproductive efficiency in farm animals.”

L.P. Reynolds, Principal Investigator, PHS Grant NICHD 45784-01-05 "Nutrition, fetal growth, and placental angiogenesis"; $1,210,000 total direct costs; April 2005-March 2010.


L.P. Reynolds Co-Principal Investigator, NSF-INBRE Grant, “IdeA Networks for Biomedical Research Excellence” – Director, Cell Biology Core Laboratory, and Mentor, “Effect of MCPA, 2,4-D and bromoxynil on lung development (Dr. Hilde van Gijssel); $174,675 total direct costs, August 2004-May 2009.

L.P. Reynolds, Co-Principal Investigator, Specific Cooperative Agreement, USDA Sheep Experiment Research Station, Dubois ID, “Birth weight and production characteristics in sheep; and Effects of elevated dietary selenium and nutrient intake on development of key maternal and fetal nutrient transferring tissues in pregnant ewe lambs” (Caton JS, Lewis G, Reynolds LP, Taylor JB).

L.P. Reynolds, Collaborator, USDA, NRI Competitive Research Grant “Placental efficiency in the ewe: Characterization of the angiogenic profile and vasoactive properties during placentome conversion;” $110,000 total costs (PI: Kimberly A. Vonnahme).

L.P. Reynolds, Collaborator, USDA, NRI Competitive Research Grant “Effect of maternal undernutrition and high selenium during gestation on growth and vascularization of key nutrient transferring tissues;” $422,000 total costs (PI: Joel S. Caton).


J.W. Schroeder (PI), North Dakota Super-Feeds Consortium, Novel Feeds from North Dakota Co-Products for High Producing Dairy Cattle – Field Peas, 10/01/08-12/31/09.

J.W. Schroeder (PI) and M.L. Bauer, Hatch Project NC 1040 (renewed), Metabolic relationships in supply of nutrients for lactating cows, 10/01/07-09/31/08.

J.W. Schroeder (Co-PI), North Dakota Oilseeds Council and Ameri-Flax, Effects of Flaxseed Supplementation on Reproduction, Health and Milk Composition in Early Lactation Dairy Cows, 09/01/06-12/31/08.

J.W. Schroeder (PI), ND State Board of Ag Research and Extension - Agricultural Research
Fund, Altering conjugated linoleic acid in bovine milk fat for nutriceutical application using flaxseed in feeding high producing dairy cattle, 01/07-12/08.

C. L. Stoltenow, Currently working with Dr. Igor Shemyakin, State Research Center for Applied Microbiology, Obolensk, Russia on developing new assays for anthrax, specifically lethal factor for detection purposes.

C. L. Stoltenow, Principle investigator for NDSU in a Mutual Confidential Disclosure Agreement with Excorp Medical, Inc. of Minneapolis, MN. Excorp has developed the first hepatic dialysis technology for humans.

C. L. Stoltenow, Economic development activities have focused on developing new and increasing existing feedlot capacities within the state to capture added value from feeding cattle that were historically exported to other states.

K. A. Vonnahme, Fall 2004-current—Effect of flax on proliferation and vascularization of the jejunum, uterus and bone of ovariectomized ewes. Animal work is complete. I am the project director. Mr. Matt O’Neil (co-advised with Dr. Greg Lardy) worked on the jejunum and growth aspect of this project for his research thesis. Research will be published in peer reviewed manuscript. Ms. Breanne Ilse will be working on the uterine data and this will be used in her thesis.

K. A. Vonnahme, Fall 2004-current—Effects of flaxseed on dairy cattle fertility. Co-PI with Drs. Ken Odde, Greg Lardy, and JW Schroeder. This is part of Mr. Nic Bork’s thesis.

K. A. Vonnahme, Fall 2008—Impacts of feeding linseed meal to beef cattle during pregnancy. Co-PI with Dr. Vern Anderson at CREC. This is part of Ms. Breanne Isle’s thesis project.

K. A. Vonnahme Co-PI with Dr. Eric Scholljegerdes, Fall 2008—Impacts of feeding flax and whole soybeans on fertility in beef cattle. Work done at the DREC.


3. Articles/books/publications

Refereed papers published


Books/book chapters


**Edited works**


**Proceedings**


Abstracts


MA Minten, LP Reynolds, ML Johnson, PP Borowicz, JJ Bilski, DA Redmer, and AT Grazul-Bilska. Expression of basic fibroblast growth factor (FGF2) and receptor (R) IIIc in uterine tissues during early pregnancy in sheep. Meeting of Mid-Western section of the American Society of Animal Sciences. Des Moines, p., abstr. no., 2008.


Mary Lynn Johnson, Mathilde Rupin, Megan Minten, Anna T. Grazul-Bilska, Jessica M. Evoniuk, Lawrence P. Reynolds, Charles L. Stoltenow, Katherine I. O’Rourke, Dale A. Redmer.


Wallace JM, Milne JS, Aitken RP, Redmer DA, Reynolds LP. 2008. Putative role for oestrogen as the missing link between nutrition and feto-placental growth restriction in overnourished adolescent sheep. J. Physiol. (abstr.).


Department reports


Extension/outreach publications


Popular articles


Berg, E. L. November 2008. To supplement or not to supplement? Valley Equestrian


Lardy, G.
- Don’t Forget the Benefits of Crossbreeding, Topp Herfords Newsletter (December 2008)
- 5-Step Process to Evaluate Winter Feeding Programs, Midwest Forage Association Newsletter (December 2008)
- Frugal Feeding, Print (Drovers Journal, November 2008)
- Make the Most of Corn Residue, Print (NDSU News Release)
- High-moisture Corn has Advantages, Disadvantages, Print (NDSU News Release)
- Testing Forages Will Pay Dividends, Print (NDSU News Release)
- NDSU Offers Tips for Better Corn Silage, Print (NDSU News Release)
- Some Weeds Can Be Used As Emergency Forage Crop, Print (NDSU New Release)
- Ammoniation Advice, Hay and Forage Grower
- Water Quality a Problem for N.D. Livestock, Print (NDSU News Release)
- Emergency Preparedness, Farm Journal
- Light Test Weight Barley Can Be Useful Feed, Print (NDSU News Release)
- Consider Early Weaning in Areas Experiencing Drought, Print (NDSU News Release)
- Reduce Costs, Graze Corn Residue, Print (Agriview)
- Early Weaning Beef Calves, Hereford E-News
- Dealing With Wet Conditions During Haying (Hereford E-News)
- Cow Production Costs Continue to Escalate, Print (Tri-State Livestock News)
- Beware of Nitrate Poisoning in Livestock, Print (NDSU News Release)
- Latest NDSU Beef Cattle, Range Research Available Online, Print (NDSU News Release)
- NDSU Beef Research Facility, Print (AgWeek)
- Technology to Measure and Select for Feed Efficiency is Improving, Hereford E-News
- NDSU Drought Information Available on the Web, Print (NDSU News Release)
- Preventing Grass Tetany, Print (Tri-State Livestock News)
- Watch for Grass Tetany When Grazing Lush Spring Growth, Hereford E-News
- Watch for Grass Tetany this Spring, Print (NDSU News Release)
- Feedlist Connects Forage Buyers and Sellers, Print (NDSU News Release)
- Farmers producing biodiesel, cattle feeders may from unique partnership, Print (NDSU News Release)
- Consolidation Continues in the Beef Industry, Hereford E-News
- JBS Purchases Drive Further Consolidation in the Beef Industry, Print (Tri-State Livestock News)
- Selecting Forages for Swathing, Beef Magazine (March 2008)
- Make the Most of Your Pasture, National Cattlemen Magazine
- Calving in the Cold, Angus Beef Bulletin (Feb)
- Correct Colostrum Handling, Storage Critical, Print (NDSU News Release)
- Tips on Handling and Storing Colostrum, Hereford News
- Managing Cow Nutrition and Body Condition Score During Late Pregnancy, Print (Tri-State Livestock News)
- Are You Prepared for Calving?, Print (ND Simmental Scene, Feb. 2008)
- Keeping’Em Alive, Print (Hereford World, Jan. 2008)
- North Dakota Ranchers Wrangle New Ideas, Print (North Dakota Living, Jan. 2008)
- Dealing with Extreme Winter Weather Conditions, Print (ND Simmental Scene, Jan. 2008)
- Managing Cow Nutrition and Body Condition Score During Late Pregnancy, Print (ND Angus Association Newsletter)
- Proper Colostrum Management is Critical for Calving Success, Print (ND Stockman Magazine)


Luther, J.S., Editor. The North Dakota Sheep Industry. February/March 2007: No. 46.
Luther, J.S., Editor. The North Dakota Sheep Industry. April/May 2007: No. 47.
Luther, J.S., Editor. The North Dakota Sheep Industry. October/November 2007: No. 50.


4. Presentations

(Includes all extension and outreach oral presentations)

Bauer, M.

Scholarly (n = 0)
Berg, E.
Scholarly (n = 8)


Berg, E.L.
Scholarly (n=0)

Other (n=2)

- Therapeutic Horsemanship
- Careers for Horse Lovers

Berg, P.
Scholarly (n = 6)

- “Beef 101”, Ransom County, ND, January 2008
- “Bar-B-Q Boot Camp, Foster County, July 2008
- Bar-B-Q Boot camp planning committee for 2009 season
- Beef Quality Audit Presentation, Dickenson, December, 2008
- Pork Quality Audit (cancelled due to blizzard) November 2008
- Product (beef) demonstration at North Star Classic, Valley City, December, 2008

**Buchanan, D.**
**Scholarly (n=1)**

**Other (n=2)**
- November 2008 – North Dakota Angus Association (Mandan) – Comments on Angus Feedout Program

**Grazul-Bilska, A.**
**Scholarly (n = 12)**
- Expression of basic fibroblast growth factor (FGF2) and receptor (R) IIIc in uterine tissues during early pregnancy in sheep. Meeting of the Mid-Western section of the American Society of Animal Sciences. Des Moines, 2008, co-author and mentor.
- Expression of Luteinizing Hormone Receptor (LHR) and mTOR Protein in Sheep Corpora Lutea during the Estrous Cycle and Prostaglandin F2α (PGF)-Induced Luteal Regression. 41st Annual SSR Meeting, May, 2008. Presenter.
- Vascularization and Expression of Fibroblast Growth Factor (FGF)2 and FGF Receptor (FGFR) 2 IIIc Protein in Uterine Tissues during Early Pregnancy in Sheep. 41st Annual SSR Meeting, May 2008, co-author
- Maternal Dietary Restriction Affects Follicle Stimulating Hormone (FSH) Receptor (R) Protein Expression in Fetal Ovaries of Sheep. 41st Annual SSR Meeting, May 2008, co-author.
- Placental microvascular growth: Implications for compromised pregnancy. Reproductive Bioengineering meeting, Wenns im Pitztal, Austria, April 1-5, 2008, co-author.
- Expression of mRNA for angiogenic factors in placental tissues during early pregnancy in

**Hammer, C.**

**Scholarly (n = 0)**

**Other (n = 6)**
- Speaker, How Color Coats are Determines, Fort Yates, ND, 50 attendees
- Organizer and Speaker, Judge’s Certification Clinic, Bismarck, ND, 15 attendees
- Speaker, Marketplace for Kids: Careers for Horse Lovers, Moorhead, MN, 249 attendees
- Speaker, Equine Careers, Bismarck, ND, 15 attendees
- Organizer and Speaker, Girl Scout Horse Fan Badge, Fargo, ND, 75 attendees
- Speaker, Vaccination and Deworming, Mandan, ND, 30 attendees

**Lardy, G.**

**Other (n = 42)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Title</th>
<th>Attendees</th>
<th>Role</th>
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<tr>
<td>Dickinson, ND</td>
<td>Beef Systems Center of Excellence Update</td>
<td>55</td>
<td>Speaker</td>
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<tr>
<td>Sidney, MT</td>
<td>Optimizing Nutritional Programs: Feed Processing and Mixing</td>
<td>26</td>
<td>Speaker</td>
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<td>Sidney, MT</td>
<td>Feeding Programs</td>
<td>26</td>
<td>Speaker</td>
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<tr>
<td>Miles City, MT</td>
<td>NDSU Research Update</td>
<td>35</td>
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<td>Minot, ND</td>
<td>Using Ethanol Byproducts in Beef Cattle Rations</td>
<td>5</td>
<td>Speaker</td>
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<td>Williston, ND</td>
<td>Using Ethanol Byproducts in Beef Cattle Rations</td>
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<td>Mandan, ND</td>
<td>Using Ethanol Byproducts in Beef Cattle Rations</td>
<td>7</td>
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<tr>
<td>Dickinson, ND</td>
<td>Using Ethanol Byproducts in Beef Cattle Rations</td>
<td>7</td>
<td>Speaker</td>
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<tr>
<td>West Fargo, ND</td>
<td>Reducing Cow Costs</td>
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<td>Speaker</td>
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<tr>
<td>West Fargo, ND</td>
<td>Reducing Cow Costs</td>
<td>35</td>
<td>Speaker &amp; Organizer</td>
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<td>Washburn, ND</td>
<td>Ration Balancing Workshop</td>
<td>28</td>
<td>Speaker &amp; Co-Organizer</td>
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<td>Fargo, ND</td>
<td>Utilizing Ethanol Byproducts in Beef Cattle Rations</td>
<td>8</td>
<td>Speaker</td>
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<td>Fargo, ND</td>
<td>Basic Beef Cattle Nutrition</td>
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<td>Turtle Lake, ND</td>
<td>Feeding Biodiesel Byproducts to Beef Cattle</td>
<td>26</td>
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<td>Streeter, ND</td>
<td>Use of Grazed Standing Annual Forages for Fall and Winter Feed</td>
<td>60</td>
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<td>Fargo, ND</td>
<td>Feeding Ethanol Byproducts to Beef Cattle</td>
<td>22</td>
<td>Speaker</td>
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<tr>
<td>Fargo, ND</td>
<td>The Basics of Beef Cattle Nutrition</td>
<td>22</td>
<td>Speaker</td>
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<td>Fargo, ND</td>
<td>Feeding Ethanol Byproducts</td>
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<td>Bismarck, ND</td>
<td>Drought Program Inservice</td>
<td>27</td>
<td>Speaker &amp; Co-Organizer</td>
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<td>Hettinger, ND</td>
<td>Impact of the Ethanol Industry on the Beef Cattle Industry</td>
<td>21</td>
<td>Speaker &amp; Co-Organizer</td>
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<tr>
<td>Bismarck, ND</td>
<td>Bringing CRP Back Into Production</td>
<td>53</td>
<td>Speaker</td>
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<td>Bismarck, ND</td>
<td>Annual Forages for Beef Cattle Production</td>
<td>33</td>
<td>Speaker &amp; Co-Organizer</td>
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<td>Bismarck, ND</td>
<td>Long Term Impact of High Corn Prices on the Beef Cattle Industry</td>
<td>37</td>
<td>Speaker &amp; Co-Organizer</td>
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<tr>
<td>Valley City, ND</td>
<td>Impact of the Ethanol Industry on the Beef Cattle Industry</td>
<td>45</td>
<td>Speaker</td>
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<td>Linton, ND</td>
<td>Emerging Issues Impacting the Beef Industry</td>
<td>65</td>
<td>Speaker</td>
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<td>Lisbon, ND</td>
<td>Management Strategies for Improved Carcass Quality</td>
<td>9</td>
<td>Speaker</td>
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<td>Lisbon, ND</td>
<td>Pricing Cattle on Grids</td>
<td>9</td>
<td>Speaker</td>
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<tr>
<td>Napoleon, ND</td>
<td>Natural Beef Production Programs</td>
<td>75</td>
<td>Speaker</td>
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<tr>
<td>Belcourt, ND</td>
<td>Practical Cow Nutrition Programs</td>
<td>25</td>
<td>Speaker</td>
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<td>Belcourt, ND</td>
<td>Basic Ruminant Nutrition</td>
<td>25</td>
<td>Speaker</td>
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<tr>
<td>Reno, NV</td>
<td>Using Ethanol Byproducts in Beef Cattle Rations</td>
<td>215</td>
<td>Speaker</td>
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<tr>
<td>Mandan, ND</td>
<td>Update on Beef Systems Center of Excellence and North Dakota Natural Beef Partnership</td>
<td>9</td>
<td>Speaker</td>
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<tr>
<td>Lisbon, ND</td>
<td>Panel Discussion: How will ethanol affect southeastern North Dakota?</td>
<td>27</td>
<td>Panelist</td>
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<td>Carrington, ND</td>
<td>Ration Formulation</td>
<td>32</td>
<td>Speaker</td>
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</table>
Carrington, ND  
Optimizing Nutrient Utilization  32  Speaker
Carrington, ND  
Feeding Programs-Receiving, Backgrounding, Finishing, Goal Setting  32  Speaker
Streeter, ND  
Long Term Impacts of the Ethanol Industry on the Beef Industry  65  Speaker
Killdeer, ND  
Emerging Issues for the Beef Industry: What is on the Horizon  22  Speaker
Bowman, ND  
Emerging Issues for the Beef Industry: What is on the Horizon  35  Speaker
Medora, ND  
Emerging Issues for the Beef Industry: What is on the Horizon  57  Speaker
Minot, ND  
Factors Affecting Value of North Dakota Feeder Calves  42  Speaker
Dickinson, ND  
Practical Cow Nutrition Programs  30  Speaker

**Luther, J.**  
**Scholarly (n = 3)**
- Influence of arginine supplementation on reproductive performance in Rambouillet ewes, NCERA 190 Meetings, Dubois, ID: June 2008.
- Effects of arginine supplementation on reproductive performance in Rambouillet ewes, National ASAS Meeting, Indianapolis, IN: July 2008.

**Other (n = 20)**

<table>
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<tr>
<th>Date</th>
<th>Location</th>
<th>Event</th>
<th>Title</th>
<th>Attendees</th>
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<tr>
<td>January, 2008</td>
<td>Tappen, ND</td>
<td>2nd Annual Shepherd's Clinic</td>
<td>“Lambing Management”</td>
<td>55</td>
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<td>January, 2008</td>
<td>Bismarck, ND</td>
<td>Ultrasonography Workshop</td>
<td>“Application of Ultrasonography Techniques to the ND Sheep Industry”</td>
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<td>February, 2008</td>
<td>Carrington, ND</td>
<td>Carrington Sheep Seminar</td>
<td>“Lambing Management-Update”</td>
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<td>February, 2008</td>
<td>Carrington, ND</td>
<td>Carrington Sheep Seminar</td>
<td>“Breeding Ewe Lambs”</td>
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<tr>
<td>February, 2008</td>
<td>Carrington, ND</td>
<td>Carrington Sheep Seminar</td>
<td>“Ram Management”</td>
<td>50</td>
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<tr>
<td>August, 2008</td>
<td>Fargo, ND</td>
<td>Fargo Ram and Ewe Sale with Educational Program</td>
<td>“Breeding Ewe Lambs”</td>
<td>75</td>
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<tr>
<td>August, 2008</td>
<td>Fargo, ND</td>
<td>Fargo Ram and Ewe Sale with Educational Program</td>
<td>“Ram Management for Fertility and Longevity”</td>
<td>75</td>
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<tr>
<td>September, 2008</td>
<td>Hettinger, ND</td>
<td>Hettinger Ram Sale</td>
<td>“The 2008 Performance Ram”</td>
<td>150</td>
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</table>
**Maddock, R.**

**Scholarly (n = 4)**
- Beef Quality and Value, Beef Feedlot School (Jan), Carrington, ND
- Producing Quality Beef, ND Stockmens (Dec), Bismarck, ND
- Beef 101 (Jan-Feb), Lisbon, ND and Enderlin, ND
- ND Assoc. of Meat Processors (Mar), Garrison, ND

**Park, C.**

**Scholarly (n = 1)**
- Dietary energy management during pregnancy and its effect on transition health in diary heifers; American Dairy Science Association Annual Meeting.

**Reynolds, L.**

**Scholarly (n = 3)**
- “Placental microvascular growth: Implications for compromised pregnancy”; *Reproductive Bioengineering* 2008, Wenns im Pitztal, Austria; April 2008
- “Developmental Origins of Health and Disease in Humans and Farm Animals: Long-Term Implications and Potential Solutions;” *Keynote Address, Fall 2008, North Dakota State University Chapter, Phi Kappa Phi Honor Society*; November 2008
- Various (n=20+) on-campus presentations at departmental seminars, Departments of Animal & Range Sciences, Biochemistry, Pharmaceutical Sciences, Veterinary Sciences & Microbiology, and Zoology, and also for the Research Administration, North Dakota State University, Fargo; 1991-2008

**Schroeder, J.W.**

**Scholarly (n=1)**
- Midwest Section Joint ADSA-ASAS Annual Meeting, Des Moines, IA. Extension Dairy Symposium Focus on Forages – Facts and Fantasies. Chair and moderator.
Other (n = 6)
- Presentations: (5)
  - Dairy Cow College >08. Feeding Strategies During Times of High Feed Costs. Linton, Dickinson, New Salem, Minot, Jamestown. Audience participation represented 13% of all dairy farms in North Dakota.

  - Presentations: (1)
    - Annual Conference of the Milk Producers of North Dakota educational programs, Mandan, ND. November 20-21, 2008. The People Behind the Product - The Family Farm Panel coordinator, program manager, and emcee.

Stoltenow, C.
Scholarly (n = 12)
- Health Programs, the Bovine Connection Feedlot School, Sidney, MT, December 3, 2008.
- Took the eXtension Agrosecurity Community of Practice nationwide, American Association of Extension Veterinarians Annual Meeting, Greensboro, NC, October 24, 2008.
- Health issues and regulations covering movement of animals in a drought, NDSU-Extension Drought In-Service, Bismarck State College, Bismarck, ND, May 14, 2008
- Beef Cattle Issues Update, We’re All in this Toegther, NDSU-Extension Service Spring Conference, Radisson Hotel, Bismarck, ND, March 31- April 2, 2008
- Pasture related animal health, Dakota Cow-Calf Video Conferences, Carrington Research Extension Center, Carrington, ND, February 6, 2008
- Most common diseases in sheep, NDSU-Extension Sheep School, Carrington Research Extension Center, Carrington, ND, February 6, 2008
- Health Programs, Cenex Harvest States, Focus on Feeds School, Aberdeen, SD, January 30, 2008
- Health Programs, Foster County Feedlot School, Carrington, ND, January 28-29, 2008

Swanson, T.
Other (n = 2)
- ND 4-H Rule Changes- NDSU Horse Fair
- Richland County 4-H Horse Camp

Vonnahme, K.
Scholarly (n = 2)
- Influence of maternal nutrition on offspring performance. Midwestern Section of ASAS. Invited speaker, March 18, 2008, Des Moines, IA.

Other (n=2)
- Invited Speaker; Rolette County Beef Days. Belcourt, ND. Reproductive Anatomy, Physiology, and Estrous Synchronization. February 12, 2008.
- Presenter; Richland County 4-H Tour, Fargo, ND. Embryo development and Ultrasound in Beef Cattle. January, 12, 2008.

Wagner, S.
Scholarly (n = 1)
- “Serum Electrolyte Concentrations Following Intravenous Administration of 50% Dextrose Solution to Fresh Dairy Cows”, Research Summaries Session, American Association of Bovine Practitioners 41st Annual Meeting, Charlotte, NC, September 26, 2008

Other (n = 2)
- “Designing Evidence-Based Therapeutic Protocols for the Large Animal Practitioner” Minnesota Veterinary Medical Association Annual Conference, Minneapolis, Minnesota, February 2008
- “Large Animal Pharmacology: Evidence-Based Therapy of Common Cattle Diseases” North Dakota Veterinary Diagnostic Laboratory Continuing Education Meeting, Fargo, ND, May 2008

5. Technology transfer

The focus of technology transfer in the department is through the extension programs. Increasing input costs due to increased feed costs have caused considerable need to help producers understand how to utilize alternative feedstuffs that can lower costs of production. Much of this, especially through the efforts of Drs. Lardy, Newman, and Schroeder has focused upon co-products from the ethanol industry. These efforts have also been facilitated through cooperative efforts with the Research-Extension Centers. Lower prices for swine and milk have increased the demand for cost-saving practices for pork and dairy producers.

C. Outreach

1. Professional service

Bauer, M. – Editorial Boards
- Associate Editor of the Journal of Animal Science

Bauer, M. – Regional
- Graduate Student Competition committee, Midwest ASAS, member

Bauer, M. – University
- Institutional Biosafety committee, member, animal expert
- Institutional Animal Use and Care committee, alternate member

Bauer, M. – Department
- Nutrition committee, member
- Beef Research committee, member
- Curriculum and Student Affairs committee, member
- Academic Quadrathlon committee, member

Berg, E.P. – Professional Meetings
- Invited Speaker, SW North Dakota Cattleman’s Day, Medora ND, January 14, 2008.
- NPB An Sci Committee Member & Attendee, National Pork Board (NPB) Unified Research Committee Meeting, Kansas City, MS, February 5-6, 2008.
- AMSA Director and Committee Chair, American Meat Science Assoc. (AMSA) Board of Directors Meeting, Chicago, IL, February 28-29, 2008.
- Attendee, MW Regional American Society of Animal Science Meetings, Des Moines, IA, March 16-17, 2008.
- PI/Organizer, NDSU Research Meeting with Speedway Restaurant, Fargo, ND, March 20, 2008.
- Meeting Chairman, Committee Chair, Session Chair, and Moderator, AMSA Annual Meeting: Reciprocal Meats Conference, Gainesville, FL, June 22-25, 2008.
- Attendee, National American Society of Animal Sciences Annual Meeting, Indianapolis, IN, July 7-11, 2008
- Invited Speaker, Value Cuts Summit, Chicago, IL, September 16-17, 2008.
- Invited Speaker, Member, & Attendee, ND Stockman’s Association Annual Meeting, Minot, ND, September 24-27, 2008.
- Invited Speaker, ND Beef commission Board Meeting, Fargo, ND, October 17, 2008.
- Committee Co-Chair, National Pork Board – Pork Quality Solutions Advisory Committee, Des Moines, IA, October 23, 2008.
- Host, Site visit for AMSA Annual Meeting (RMC), Fargo, ND, November 17-19, 2008.
- Committee Member and Attendee, National Pork Board – Animal Science Committee, Des Moines, IA, December 2-3, 2008.

Berg, E.P. – Editorial Boards
- Journal of Muscle Foods

Berg, E.P. – National/International
- Member, American Society of Animal Science Meats Research Award committee. 2007 – 2009.
- Member. Pork Checkoff Animal Science Committee, National Pork Board. 2004 to present.
- Member. Educators Advisory Group of Swine Extension and Adult Ag Educators, National Pork Board. 2003 – Present.

Berg, E.P. – Regional

Berg, E.P. – College
- Member, Multi-cultural Student Faculty Advisory Committee. 2008 – Present

Berg, E.P. – Department
- Chair, Faculty Search Committee, Asst./Assoc. Professor (Livestock Judging/ Youth activities)
- Member, Chairman’s ad hoc advisory committee; Dept financial allocations. May to June 2008.
- Member, Chairman’s ad hoc advisory committee; Developing a Departmental External Advisory Committee, March 1 to 30, 2008.
- Member, Beef Research Facility Committee, Oct. 2007 to present.
- Chair, Swine Committee, 2007 – present.
- Member, Graduate Committee, 2007 – present.
- Member, Facilities Planning Committee, 2007 – present.
- Member, Academic Quadrathlon Committee, 2007 – present.

Berg, E.P.- Director
- American Meat Science Association 2006-2008
Berg, E.P. – Manuscript Review
- Journal of Animal Science (3)
- Meat Science (4)
- Journal of Muscle Foods (3)

Berg, E.P. – Extension
- ND State FFA Meats Judging Contest, Fargo, ND, 100 attended

Berg, E.L. – Professional Meetings
- March 14 – 17, 2008 NARHA Region 6 Conference, Regional, Fargo, ND, co-organizer.
- May 17 – 19, 2008 NARHA Advanced Instructor Certification, Three Gaits Therapeutic Riding Center, National, Stoughton, WI, participant.
- November 2, 2008 NARHA Faculty Evaluator Training, International, Hartford, CT, participant.

Berg, E.L. – Regional
- Alpha Equus English Riders, Treasurer and Horse Show Chairperson

Berg, E.L. – Extension
- NDSU Horse Fair, Fargo, ND, April 20, 2008, over 1,000 attended.
- Wish I Had a Horse Camp, Fargo, ND, October 11, 2008, 40 attended.
- Wish I Had a Horse Camp, Fargo, ND, March 9, 2009, 40 attended.


Berg, E.L., Official, Red River Valley Fair 4-H Horse Show, West Fargo, ND, June 18, 2008.

Berg, E.L. – Radio & TV
- NDSU Therapeutic Horsemanship Program, KVLY (Radio).
- NDSU and ROAW Partnership, KVLY (TV).
Berg, P.T.  Organized and served “Military Appreciation Day” sponsored by the ND Beef Commission at the State Fair, July 2008 (fifth year of providing a noon meal for approximately 1200 servicemen and women)

Berg, P.T.  Served as Judge for Northern Steer Classic, North Dakota Winter Show

Berg, P.T.  Planned and provided “special” dinners for NDSU football team (four events, fall 2008

Berg, P.T. – National/International
- Intercollegiate Meat Coaches Assoc. of AMSA

Berryhill, D.
- Director of Special Programs, College of Agriculture, Food Systems, & Natural Resources (30%), including Director of the General Agriculture Program
- Responsible Official, Select Agent Program (% not determined)

Berryhill, D.-University
- Chair, Institutional Biosafety Committee
- Member, Natural Resources Management Coordinating Committee
- Member, Natural Resources Graduate Program Steering Committee
- Alternate Member, Institutional Animal Care and Use Committee
- Member, Visual Arts Gallery Program Advisory Committee
- Member, University Athletics Committee
- Member, Laboratory and Chemical Safety Committee
- Member, NCAA Athletics Certification Academic Integrity Subcommittee
- Member, Disaster Resistant University Advisory Committee
- Member, Multicultural Student Services Faculty Advisory Committee
- Member, Search Committee for Research Compliance Administrator – IACUC & IBC

Berryhill, D. – College
- Member, College of Agriculture, Food Systems, & Natural Resources Student Progress Committee
- Member, College of Agriculture, Food Systems, & Natural Resources Curriculum Committee

Berryhill, D. – Department
- Chair, Awards Nomination Committee
- Member, Curriculum/Student Affairs Committee
- Member, Graduate Committee
- Chair, Veterinary Technologist Search Committee

Buchanan D. – Professional Meetings
- Midwest Section – American Society of Animal Science. Des Moines, IA. March 2008 - attendee
- Joint Annual Meeting – American Society of Animal Science and American Dairy Science Association – Indianapolis. July 2008 – attendee, participated in the meeting of the Board of
Directors and gave invited Centennial presentation.

Buchanan, D. Exemplary Faculty Award – College of Agricultural Sciences and Natural Resources – Oklahoma State University - 2008

Buchanan, D. Reviewed three articles for the Journal of Animal Science

Buchanan, D. – National/International
- Advisory Committee – US Pork Center of Excellence Swine Schools Online.
- NCAC-6 Livestock Production
- NCERA 190 Sheep Production and Management (Administrative Advisor)

Buchanan, D. – State
- Red River Valley Research Partners – member

Buchanan, D. – University
- Advising Task Force - Chair

Maddock Carlin, K.R. – Professional Meetings
- *American Society of Animal Science Midwestern Section Meetings*, Des Moines, IA. Undergraduate Research Competition

Maddock Carlin, K.R. – Manuscript Review
- *Journal of Animal Science* (2)
- *Meat Science* (2)
- *Journal of Muscle Foods* (2)

Maddock Carlin, K.R. – National/International
- AMS Meat Tenderness Committee – Predictive Technology Subcommittee
- ASAS Meat Science and Muscle Biology Committee

Maddock Carlin, K.R. – University
- Faculty and Staff Campaign. Agricultural Zone 2.

Maddock Carlin, K.R. – College
- College Space Audit Committee – supply information on Animal Sciences Dept. Space Usage on Campus.

Maddock Carlin, K.R.- Department
- Awards Committee
- Quadrathalon Committee – Set up Lab Practical

Colville, T. attended the North American Veterinary Conference, January 19-23, 2008, Orlando,
FL. National Meeting.

Colville, T. is liaison to the North Dakota State University Veterinary Technology Program Advisory Committee.

Colville, T. – Department
- Member, ANSC Awards Committee.
- Member, ANSC Curriculum/Student Affairs Committee.
- Member, ANSC Facilities Planning Committee.
- Member, ANSC PTE Committee.
- Chair, ANSC PTE Mentoring Committees for Dr. Sarah Wagner and Dr. Charles Stoltenow.
- Member, ANSC PTE Mentoring Committee for Dr. Rob Maddock.

R. Danielson attended the September 2008 - ND Stockman’s Association Convention - Research & Promotion Committee member – Bismarck, ND.

R. Danielson received the 2008 North Dakota Stockman Association Lifetime Member Award.

R. Danielson was Herd Consultant for the Goldberg Angus Farms in Moorhead, MN.

Danielson, R. – National
- National Cattlemen’s Beef Association – Research Committee – 2004- current
- Beef Improvement Federation - Live Animal Evaluation Committee - 1990-current

Danielson, R. – Regional
- Board of Directors for the ND Cowboy Hall of Fame
- Secretary/Treasurer ND Cowboy Hall of Fame
- ND Cowboy Hall of Fame Executive Fund Raising Committee
- North Star Classic Livestock Show Board of Directors
- ND Winter Show - Livestock Committee
- ND Winter Show - Steer Shows - Chair

Danielson, R. – State
- ND Stockman’s Association Student Mentoring Program Board of Directors
- ND Livestock Endowment Foundation
- United Tribes Technical College Land Grant Strategic Planning and Program Review Committee
- ND Junior Beef Expo Board of Directors

Danielson, R. – University
- University Assessment Committee – 2004-2008

Danielson, R. – College
- Academic Advising Committee - 1993-current
- College of Agriculture Scholarship Committee - 2000-current
- College of Agriculture Recruitment Committee - 2001-current

Danielson, R. – Department
- Undergraduate Curriculum & Student Affairs Committee - Chair
- ARS Equine Faculty Search Committee
- ARS Beef Committee
- ARS Equine Committee
- ARS Assessment Committee
- ARS Mentoring Committee for Dr. Carrie Hammer - Chair
- ARS Mentoring Committee for Dr. Justin Luther

Danielson, R. - Secretary/Treasurer North Dakota Livestock Endowment Foundation

Eck, Tate – Professional Meetings
- April 2008 South Dakota State University – Brookings, SD
- April 2008 University of Nebraska – Lincoln, NE
- April 2008 Black Hills State University – Spearfish, SD
- May 2007 Dickinson State University – Dickinson, ND
- September 2008 University of Wisconsin – River Falls Rodeo; River Falls, WI
- September 2008 Iowa State University Rodeo – Ames, IA
- September 2008 Iowa Central Community College Rodeo – Fort Dodge, IA
- October 2008 North Dakota State University Rodeo – Fargo, ND

Grazul-Bilska, A. – Professional Meetings
- Frontiers in Reproduction symposia, Marine Biological Laboratory, Woods Hole, MS, June, 2008 - international meeting.
- Dakota Reproductive Biology Symposium, Sioux Falls, 2008 – regional meeting.

Grazul-Bilska, A. was nominated for Eugene R. Dahl Excellence in Research Award, 2008.

Grazul-Bilska, A. – Editorial Boards
- Reproductive Biology and Endocrinology

Grazul-Bilska, A. reviewed 23 scientific papers for Animal Reproduction Sciences; Reproduction; Reproduction, Fertility and Development; Endocrine; Pharmacological Research; Theriogenology; Journal of Endocrinology; the Canadian Veterinary Journal, the Professional Animal Scientist and one paper as USDA internal reviewer.

Grazul-Bilska, A. reviewed two abstracts for the 35th Annual Conference of the International Embryo Transfer Society, San Diego, January, 2009

Grazul-Bilska, A. reviewed 11 grants for Presidential Award for Graduate Program, NDSU, and one grant for Israel Science Foundation.
Grazul-Bilska, A. – National/International
- Society for the Study of Reproduction, 2008-present, member of the Membership Committee

Grazul-Bilska, A. is a Mentor for the Principal Investigator from the Dickinson State University within INBRE Program, North Dakota.

Grazul-Bilska, A. – University
- Radiation Safety Committee, member
- Member of the Steering Committee of the CMB program
- Senate, member
- NDSU Equal Opportunity Hearing Panel, member

Grazul-Bilska, A. – College
- Faculty Development Committee, member

Grazul-Bilska, A. – Department
- Graduate Coordinating Committee, chair
- Quadrathlon Committee, member

Hammer, C. was an attendee of the American society of Animal Science National Meeting July 7-11, 2008 in Indianapolis, IN.

Hammer, C. was inducted in Spring 2008 into Gamma Sigma Delta-Honor Society of Agriculture.

Hammer, C. was nominate for the William J. and Angelyn A. Autin Advising Award for Excellence from North Dakota State University.


Hammer, C. – National/International
- Member of American Association of Equine Practitioners
- National Western 4-H Roundup – Horse Committee
- Co-Chair, Quiz Bowl
- AAEP State Equine Emergency Network Contact for ND

Hammer, C. – State
- Equine representative for the North Dakota Animal ID Committee
- Open Board Member of the North Dakota Quarter Horse Association
- Board Member of the North Dakota Horse Park Foundation

Hammer, C. – Department
- Chair of the Equine Committee
- Member of the ARSGSO Scholarship Review Committee
- Member of the Recruitment, Retention, Placement, & Curriculum Committee

Hammer, C. – Extension
- Coordinator and speaker, Wish I Had A Horse Camp – October 2008 (40 participants)
- Advisor and Speaker, NDSU Horse Fair – April 2008 (approximately 800 attendees)
- Coordinator and speaker, Wish I Had A Horse Camp – March 2008 (25 participants)
- Fuzzy Wuzzy Open Horse Show – March 2008 (40 participants)

C. Hammer attended Biological Risk Management. Wyeth Veterinary Continuing Education. Brandon, MB. October 18, 2008

C. Hammer attended Equine Nutrition. NDSU Diagnostic Laboratory Veterinary Continuing Education. May 15, 2008.

Hammer, C. – Radio & TV
- RFD-TV “Live”. RFD-TV is the nation’s first television channel solely dedicated to rural America and agriculture; they have an estimated 188 million viewers. The “Live” program allows topics of interest to be discussed by a panel of experts with time for call-in questions from viewers.
- Colic. RFD-TV “Live” program. 6/16/2008.
- Horse Sense Radio – Daily horse program broadcast by 22 radio stations in Minnesota and North Dakota.
- Winter Horse Care #1-#5, 11/17/08-11/21/08
- Jobs, jobs, jobs. 3/28/08
- Electives. 3/27/08
- Ideas for Prospective Students. 3/26/08
- Get Real. 3/25/08
- Careers in the Horse Industry. 3/24/08

Hammer, C. – Other Extension
- Organizer, Winter Show 4-H Hippology Contest, March 7, 2008
- Judge, Little International 4-H Hippology Contest, February 8, 2008
- Judge, National Western Horse Classic Horse Bowl, January 12, 2008
- Judge, National Western Horse Classic Horse Demonstration, January 11, 2008

Lardy, G.P. – Editorial Boards
- Associate Editor. Journal of Animal Science.

Lardy, G.P. – Professional Meetings
- Midwest ASAS. Regional. Midwest ASAS Director at Large.
- National ASAS. National. Midwest ASAS Director at Large. Program Chair 2010 Meetings.
- NCERA-206. Feedlot Nutrition and Management
Lardy, G.P. – Professional Activities
- Midwest ASAS Director at Large.
- USDA NRI Small and Medium Sized Farm Prosperity Grant Panel.
- NCR SARE Technical Committee.
- Production Research Committee. Member, National Cattleman’s Beef Association, 2006-Present.

Lardy, G.P. - Ad Hoc Reviewer
- Journal of Animal Science
- Canadian Journal of Animal Science
- Animal Science and Feed Technology
- Rangeland Ecology and Management

Lardy, G.P. – National/International
- Journal of Animal Science, Associate Editor. Production and Management Division. 2006-Present.

Lardy, G.P. – Regional
- NCR-206. Feedlot cattle nutrition and management.

Lardy, G.P. - College
- Mentoring Committee, Kevin Sedivec, 2008-Present

Lardy, G.P. – Department
- Member and Chair, Beef Research Facility Building Committee, 2007-Present
- Member of Animal Science Showcase, 2007-Present
- Member and Co-Chair of Mentoring Committee, Dr. Kasey Carlin, 2007-Present
- Member and Chair of Mentoring Committee, Dr. Justin Luther, 2006-Present
- Member of Mentoring Committee, Dr. Carrie Hammer, 2005-Present
- Member of Mentoring Committee. Dr. Kim Vonnahme, 2004-Present

Lardy, G.P. – Extension
- Organizer of Nutrient Management in Depth Training, Fargo, ND; 60 enrolled
- Organizer and Speaker, Big Iron Livestock, West Fargo, ND; 35 enrolled
- Organizer and Speaker, Extension Agents Livestock In-service, Washburn, ND; 50 enrolled
- Speaker and Co-Organizer, Drought In-Service Training, Bismarck, ND; 27 enrolled
- Organizer and Speaker, Pfizer-NDSU Scientific Exchange, Hettinger, ND; 25 enrolled
- Organizer and Speaker, Pfizer-NDSU Scientific Exchange, Fargo, ND; 25 enrolled

Lardy, G.P. – TV and Radio
- Cattle Feeding Moving North: Radio (Clear Channel)
- Factors Affecting Value of North Dakota Feeder Calves: Radio (Forward Communication)
- Reducing Winter Feeding Costs: Successful Farming Radio (North Shore Productions)
- Beef Cattle Issues: Radio (KQLX)
- Drought Conditions in North Dakota: Radio (WDAY)
- Livestock Management Before, During, and After Floods: Radio (USDA; Washington, DC)
- Using Ethanol Byproducts in Beef Cattle Rations: Radio (Clear Channel)
- Using High Moisture Corn in Cattle Rations: Radio (Clear Channel)
- Using High Moisture and Light Test Weight Corn: Radio (KQLX AgShow)
- Stretching Tight Hay Supplies During a Tough Winter: Radio (Clear Channel)

Luther, J.S. – Professional Meetings
- North Dakota Lamb and Wool Producers Convention in Mandan, ND. State Meeting. Coordinator and Speaker.
- Spring NDSU Extension Conference in Fargo, ND. State Meeting. Participant.
- Fall NDSU Extension Conference in Fargo, ND. State Meeting. Participant.

Luther, J.S, received the 2008 Myron and Muriel Johnsrud Excellence in Extension Award.

Luther, J.S., reviewed 2 article for each Placenta and the Journal of Animal Science. In addition, I reviewed one article for the USDA Sheep Experiment Station manuscript submission process.

Luther, J.S., is 2008 Secretary of the NCERA – 190 Committee.

Luther, J.S. – National/International
- NCERA 190 Committee: *Increased Efficiency of Sheep Production.*
- NCERA 190 Resolutions Committee: *Increased Efficiency of Sheep Production*
- American Sheep Industry Association: Research and Education Committee
- American Sheep Industry Association: Genomics Committee

Luther, J.S. – University
- Center for Child Development: Parent Committee

Luther, J.S. - Department
- ARS: Sheep Committee

Luther, J.S. – Extension

*Press Releases*

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<tr>
<th>Date</th>
<th>Title of Article</th>
<th>Program</th>
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<tr>
<td>April, 2008</td>
<td>Lamb and Wool Producers Support Youth Involvement in Sheep Industry</td>
<td>Starter Flock Program</td>
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<tr>
<td>July, 2008</td>
<td>Fargo Ram Sale Set for Aug. 2</td>
<td>Fargo RR Ram Sale</td>
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<tr>
<td>July, 2008</td>
<td>Hettinger Ram Sale Set for Sept. 17</td>
<td>Hettinger Ram Sale</td>
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### Long-Term Outreach Activities

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<tr>
<th>Dates</th>
<th>Project / Activity</th>
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<tr>
<td>April, 2006 - Present</td>
<td>Annual Spring Performance Ram Test Program</td>
<td>Co-Coordinator / Co-Manager</td>
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<tr>
<td>October, 2006 - Present</td>
<td>Annual Fall Performance Ram Test Program</td>
<td>Co-Coordinator / Co-Manager</td>
</tr>
<tr>
<td>September, 2006 - Present</td>
<td>Annual Ram Test Progeny Testing Project</td>
<td>Coordinator</td>
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<tr>
<td>March, 2006 - Present</td>
<td>North Dakota Lamb and Wool Producers Website</td>
<td>Webmaster</td>
</tr>
</tbody>
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Luther, J.S., developed the Tri-State Meat Goat Conference Education Presentations CD.

Luther, J.S., developed a video clip called AI in Sheep.

### Luther, J.S. – TV and Radio

<table>
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<tr>
<th>Date</th>
<th>Title</th>
<th>Media Type (TV and/or Radio)</th>
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<tbody>
<tr>
<td>February, 2008</td>
<td>NDSU Sheep Research</td>
<td>TV</td>
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<tr>
<td>February, 2008</td>
<td>North Dakota Youth Starter Flock Program</td>
<td>Newspaper – New York Times</td>
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<tr>
<td>February, 2008</td>
<td>North Dakota Youth Starter Flock Program</td>
<td>Newspaper – Chicago Tribune</td>
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<tr>
<td>February, 2008</td>
<td>North Dakota Youth Starter Flock Program</td>
<td>Newspaper – Ag Week</td>
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<tr>
<td>February, 2008</td>
<td>North Dakota Youth Starter Flock Program</td>
<td>Newspaper – Bismarck Tribune</td>
</tr>
<tr>
<td>March, 2008</td>
<td>Sheep Research Update</td>
<td>Radio</td>
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<td>March, 2008</td>
<td>Spring Ram Testing Program</td>
<td>Radio</td>
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<tr>
<td>April, 2008</td>
<td>Current NDSU Sheep Extension Programs</td>
<td>Radio</td>
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<tr>
<td>July, 2008</td>
<td>Fargo Ram Sale</td>
<td>Radio</td>
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<tr>
<td>July, 2008</td>
<td>Fargo Ram Sale Event</td>
<td>Newspaper – Aberdeen Times</td>
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<tr>
<td>July, 2008</td>
<td>Fargo Fiber Festival</td>
<td>Newspaper – Fargo Forum</td>
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<tr>
<td>July, 2008</td>
<td>Fargo Ram Sale Event</td>
<td>Newspaper – Ag Week</td>
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<tr>
<td>August, 2008</td>
<td>Hettinger Ram Sale</td>
<td>Radio</td>
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<tr>
<td>September, 2008</td>
<td>Bowman Ewe Sale</td>
<td>Radio</td>
</tr>
</tbody>
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Luther, J.S. – Other Extension Activities
- Approximately 40 visits to sheep operations in ND and MN in 2008.
- Bowman County Fair. Attended Sheep Show. July ’08
- ND State Fair. Sheep Show Ring Steward. July ‘08
- Central WI Lamb Jackpot Show Judge. July ’08
- NDLWPA Meeting in Mandan. February ‘08
- NDLWPA Meeting in Mandan. April ‘08
- NDLWPA Meeting in Mandan. June ‘08
- NDLWPA Meeting in Mandan. August ‘08
- NDLWPA Meeting in Mandan. September ‘08
- NDLWPA Meeting in Mandan. November ‘08
- Provided on-the-farm ultrasound demonstrations and AI clinics for more than 10 different ND sheep producers in 2008

Maddock, R. J. – Professional Meetings
- Reciprocal Meat Conference – National Meeting of Meat Scientists
- National Cattlemen’s Beef Association – National Meeting of US Cattlemen

Maddock, R.J. – Journal Reviews
- Journal of Animal Science (4)
- Meat Science (2)
- Journal of Food Science (1)

Maddock, R.J. – National/International
- By-laws committee of American Meat Science Association

Maddock, R.J. – Regional
- W2177 “Improving competitiveness of US Meat” 5% of time.

Maddock, R.J. – Department
- Curriculum Committee – Developed and Entire new set of options for Animal Science majors; Scholarship Committee, assigned Animal Science Scholarships to deserving students.

Maddock, R.J. – Extension
- HACCP Training, Fargo, ND: 12 attended
- HACCP Training, Fargo, ND: 12 attended
- HACCP Training, Omaha, NE (with Univ. of NE): 30 attended
- BBQ Boot Camp, Carrington, ND: 55 attended

R.J. Maddock was routinely contacted by meat processors from ND and beyond concerning HACCP, processing, plant operation, and food safety concerns. Companies included Pizza Corner (Valley City), Bowden Meat Group, Firehouse ribs (Medina), ND Meat Inspectors, and several others (over 15 other plants were contacted throughout the year).

R.J. Maddock met with Sitting Bull College to discuss possible Extension, research, and teaching opportunities.


Park, C.S. - Reviews
- Reviewed USDA-NRI proposal (1).
- Reviewed Journal of Dairy Science manuscripts (2).
- Reviewed Journal of Animal Science (1).
- Reviewed Domestic Animal Endocrinology (1).

Park, C.S. – National/International
- Advisory Member of Korean National Academy of Sciences for Agricultural Affairs.

Park, C.S. – University
- Institutional Biosafety Committee

Park, C.S. – Department
- Promotion, Tenure and Evaluation Committee
- Dairy Committee
- Graduate Committee

C.S. Park provided advice to NDSU extension specialists and county agents.

C.S. Park continues advising livestock producers in the U.S. and Canada.


Redmer, D.A. attended the American Society of Animal Science, Midwestern Section meeting.

Redmer, D.A. – Editorial Boards
- Biology of Reproduction

Redmer, D.A. – Manuscript Reviews
- Biology Reproduction
- Reproduction – Based in United Kingdom

Redmer, D.A. – University
- University Senate - senator
- Research Information Technology Advisory Group (RITAG) – member
- Institutional Animal Care and Use Committee – member

Redmer, D.A. – Department
- Sheep Committee (Chair)
- PTE Committee
- Mentoring committees: Charlie Stoltenow, Anna Grazul-Bilska, Carrie Hammer, Erica Berg

Reynolds, L.P. – Professional Meetings
- Reproductive Bioengineering 2008, Wenns im Pitztal, Austria; April 2008
- Annual meeting, Society for the Study of Reproduction, Kona, HI; May 2008
- Annual meeting, American Society of Animal Science, Indianapolis, IN; July 2008

Reynolds, L.P. – Editorial Boards
- Journal of Biomedicine and Biotechnology (http://www.hindawi.com/journals/jbb/), 2008-present
Reynolds, L.P. – Awards/Honors
- Named University Distinguished Professor of Animal Science, October 2008

Reynolds, L.P. – Other Professional
- Co-Director, Center for Nutrition and Pregnancy – North Dakota State University, 2002-present
- Executive Committee (Board of Directors), American Society of Animal Science, Sept 2005 to Aug 2008
- Member, International Scientific Committee and Session Chair, Reproductive Bioengineering 2008, Wenns am Piztal, Austria; April, 2008
- Symposium/Review Article Committee, American Society of Animal Science, 2008-09
- Member, Promotion, Tenure, and Evaluation Committee, Department of Pharmaceutical Sciences, North Dakota State University, Fargo, ND; 2008-present

Reynolds, L.P. – Article Reviews
- American Journal of Pathology, 2000-present
- American Journal of Physiology, 1994-present
- Animal Reproduction Science, 2003-present
- Biology of Reproduction, 1990-present
- Domestic Animal Endocrinology, 1993-present
- Endocrine, 1994-present
- Endocrinology, 1989-present
- Endothelium, 2004-present
- Experimental Biology and Medicine, 2002-present
- FASEB Journal, 2004-present
- Fertility and Sterility, 2000-present
- Journal of Animal Science, 1984-present
- Journal of Biotechnology
- Journal of Clinical Endocrinology and Metabolism, 2000-present
- Journal of Dairy Science, 1997-present
- Journal of Endocrinology, 1994-present
- Journal of Molecular Endocrinology, 2005-present
- Journal of Nutrition, 2006-present
- Journal of Pharmaceutical Sciences, 1999-present
- Journal of Physiology, 2004-present
- Molecular and Cellular Endocrinology, 2001-present
- Obstetrics & Gynecology, 1997-present
- Pediatric Research, 1996-present
- Placenta, 1993-present
- Prostaglandins, 1992-present
- Theriogenology, 1994-present

Reynolds, L.P. – National/International
- National Institutes of Health (ORWH, NIAMS, NICHD, NIDDK, NIDA, NIEHS, NIMH) and FDA Special Emphasis Panel, RFA for Specialized Centers of Interdisciplinary Research (SCOR) on Sex and Gender Factors affecting Women’s Health (P50), Panel Member, Mail Reviewer; March 2007
- National Institute of Child Health and Human Development, Program Project Special Emphasis Panel (ZHD1 DSR-L CH) Member, NIH; Conference Call Review; July 2007
- National Institute of Child Health and Human Development, Program Project Special Emphasis Panel (ZRG1 EMNR-H 02 M; Member Conflict, Reproductive Biology Review Committee) Member, NIH; Conference Call Review; August 2007
- Ad hoc reviewer, US and international agencies
  - Agricultural Research Service, USDA, 1988-present
  - Biomedical Research Support Grant Program, NIH, 1988-present
  - Biotechnology and Biological Sciences Research Council (UK equivalent to NSF), UK, 1997-present
  - Competitive Research Grants Program, USDA, 1988-present
  - IDeA (EPSCoR) Seed Grant Program, NIH, 1993-present
  - Medical Research Council (UK equivalent to NIH), UK, 2007-present
  - National Science Foundation, Switzerland, 1994-present
  - National Science Foundation, USA; Applied Mathematics and Computational Mathematics Program; Integrative Animal Biology, Physiology and Behavior Program; Integrative Animal Biology, Signal Transduction and Regulation Program; 1995-present
  - National Science Foundation, USA; EPSCoR program, 1996-present
  - Research Grants Council of Hong Kong, University Grants Committee, 2002-present
  - Small Business Innovation Research Program, USDA, 1987-present
  - University of Kansas Medical Center Res. Inst., Inc., Res. Pilot Awards Program, 1999
  - U.S.-Israel Binational Agricultural Research and Development Fund (BARD), 1995-present
  - The Wellcome Trust, London, UK, 2000-present

Reynolds, L.P. – University
- Faculty, undergraduate Biotechnology Program
- Faculty, graduate Cellular and Molecular Biology Ph.D. Program
- Mentor, 2 new faculty, NDSU – Dr. Chengwen Sun, Asst. Prof., Dept. of Pharm. Sci.; and Dr. Peggy Biga, Asst. Prof., Dept. of Biol./Zool.
- Mentor, 2 faculty associated with active grants – Dr. Glenn Dorsam, Dept. of Chem./Biochem., NDSU, COBRE (Sibi, PI); and Dr. Hilde vonGijsell, Dept. of Science, Valley City State Univ., INBRE (Sens, PI)

Reynolds, L.P. – Department
- Supervisor, Physiology Laboratory Technician Pool (4 permanent and 1 to 2 temporary [3 to 5 yr] technical positions), which is responsible to 7 PIs – Department of Animal & Range Sciences, North Dakota State University, 2004-present
- Faculty Grantsmanship Mentor, New Faculty (currently 6 faculty) – Department of Animal & Range Sciences, North Dakota State University, 2004-present
- Chair, PTE Mentoring Committee for Dr. Eric Berg, Assoc. Prof., 2004-06
- Member, PTE Mentoring Committee for Dr. Anna Grazul-Bilska, Assoc. Prof., 2004-present
- Member, PTE Mentoring Committee for Dr. Sarah Wagner, Asst. Prof., 2004-present

Schroeder, J.W. – Professional Meetings
- ADSA-ASAS Joint Annual Meeting, Indianapolis, IA
- Beyond Borders International Animal Agro security Conference
- Midwest Section Joint ADSA-ASAS Annual Meeting, Des Moines, IA
- International Flax Institute and Short Course. March 24-26, 2008, Fargo, ND


J.W. Schroeder reviewed DAIReXNET Community of Practice and has contributed to the calf and heifer domain plus the nutrition, production, and management domain. Reviewed a total of 16 submissions.

Schroeder, J.W. – Regional
- Extension dairy committee chair and nominee for office, Midwest Section - American Dairy Science Association/American Society of Animal Science.
- Ex-official advisor, represent NDSU, Midwest Dairy Association, American Dairy Council.
- Ex-officio advisor, Heart of America DHIA, University Extension representative.

Schroeder, J.W. – State
- Board of directors and Dairy retention and expansion committee, North Dakota Dairy Coalition.
- Open dairy show organization and manager, North Dakota State Dairy Show Association, David. Thoreson Nome, ND, President.
- Milk Producers Association of North Dakota; University representative and advisor, Education committee, Convention coordinator.
- North Dakota Dairy Products Promotion Commission/ADA; ex-officio advisor.

Schroeder, J.W. – University
- University Senate, Representative from the College of Agriculture, Food Systems, and Natural Resources. 2006-2009.
- University Assessment Committee (UAC) Extension Service representative, 2000 to 2008.

Schroeder, J.W. – College
- Executive Committee representative from the College of Agriculture, Food Systems, and Natural Resources. 2008-2009.

Schroeder, J.W. – Department
- Dairy Committee, ARS standing research committee, chair
Schroeder, J.W. – Other committees
- Central Dakota Dairy, feasibility study with Greg Lardy and Wally Eide. Plans for a 5,000-cow dairy with methane digester.
- Dakota Farms Dairy, a specialty and branded products development collaboration
- On-farm dairy processing plant feasibility

Schroeder, J.W. – Extension Events Planned
- Farm Yard Social assisted in the organization and implementation of a regional Day-on-the-Farm in collaboration with Gary Hoffman, Executive Director of the North Dakota Dairy Coalition and Char Heer, Midwest Dairy Association with 200 plus adults and youth
- Dairy Cow College, 1/28 to 2/01 (Plan, coordinate, prepare, promote, and co-present): Education program with 92 attendees.
- State Dairy Convention, 11/20-21 (Organize, advertise, promote, coordinate and co-present), Mandan, ND: 210 attendees
- State 4-H Dairy Contest, 06/22 (Co-organize with Dean Aakre, Extension 4-H/Youth, Jackie Buckley, Morton County Extension Educator, and three producers from the New Salem area: 4 teams and 19 individuals.

Schroeder, J.W. – Other Extension
- State FFA Convention (06/02-06) NDSU ARS, Fargo:
  Dairy cattle judging Contest, 6/03: 109 attendees
  Pedigree evaluation, 6/03: 111 attendees
  Herd record evaluation, 6/03: 111 attendees
  Dairy products judging Contest, 6/04: 138 attendees
  Written individual exam, 6/04: 138 attendees
  Team problem-solving - dairy foods, 6/04: 138 attendees
- ND3P (North Dakota Dairy Diagnostic Program). On-farm advisory teams designed specific to the individual dairy farm family=s needs. Organized and conducted with ND3P facilitator and statewide coordinator (T. Risdal) to improve leadership and planning skills, enhance profitability, and transfer technology.

Schroeder, J.W. – Teaching Materials
- Internet: NDSU Dairy Research information and user links on current issues important to the dairy community.
- eXtension: Respond to questions.
- Dairy Connections: Quarterly newsletter circulated to all North Dakota dairy producers and many of their service providers. (Copies available on request).
- Progressive Dairyman: Contributing author.
- Dairy Star: Contributing author.

Schroeder, J.W. – Radio and TV
<table>
<thead>
<tr>
<th>Date</th>
<th>Title of Presentation</th>
<th>Location</th>
<th>TV</th>
<th>Radio</th>
<th>News Enews</th>
<th>Other</th>
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<tr>
<td>01-17-08</td>
<td>2008 Dairy Cow College Offered at 5 Sites</td>
<td>Statewide</td>
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<td>03-11-08</td>
<td>Ultra-filtration - milk regs</td>
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<td>KVLY</td>
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<td></td>
<td>Dairy impact of rural ND</td>
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<td>04-09-08</td>
<td>Daylight savings affects workers, not cows</td>
<td>Regional</td>
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<td>05-22-08</td>
<td>Dairy Focus: Is Ethanol an Economic Shock or Agricultural Shift?</td>
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<td>05-29-08</td>
<td>Dairy Focus: Some Feed Cost Cutbacks Can Cost You</td>
<td>Regional</td>
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<td>06-05-08</td>
<td>Dairy Focus: What is In Your Ration?</td>
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<td>06-19-08</td>
<td>Dairy Focus: Feeding Your Dairy Herd in 2008 a Challenge</td>
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<td>06-26-08</td>
<td>Dairy Focus: Cutting Feed Costs Has Consequences</td>
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<td>06-26-08</td>
<td>Forage Contracts Help Ensure Payment</td>
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<td>07-17-08</td>
<td>Lowering Feed Costs Begins with Control</td>
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<td>07-17-08</td>
<td>Dairy Focus: Cows Do Not Need Corn</td>
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<td>07-24-08</td>
<td>Dairy Focus: Feedstuff Comparisons Offer Interesting Results</td>
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<td>07-31-08</td>
<td>Dairy Focus: Make Better Use of Byproduct Feeds</td>
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<td>08-07-08</td>
<td>Dairy Focus: Use Feed Strategies to Optimize Profits</td>
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<td>08-21-08</td>
<td>Canola Possible Forage Crop for Livestock</td>
<td>Regional</td>
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<td>09-18-08</td>
<td>Stage, Moisture Vital to Making Silage</td>
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<td>09-25-08</td>
<td>Proper Harvest Critical to Making Silage</td>
<td>Regional</td>
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<td>09-25-08</td>
<td>Whole-plant Corn Can Make Good Silage</td>
<td>Regional</td>
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<td>11-06-08</td>
<td>N.D. Dairy Convention Set for Nov. 20-21</td>
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<td>12-04-08</td>
<td>Corn Silage May Not Measure Up This Winter</td>
<td>Regional</td>
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<td>KQLX</td>
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- Also, Web pages updated bi-weekly to monthly featuring Co-product Price update

Stoltenow, C.S. – Professional Meetings
- International Livestock Congress, Calgary, Alberta, Canada, July 10-11, 2008. *(Invited guest*
of the Canadian Consulate, Minneapolis, MN)

- Scientific Exchange and Research Oversight Review visit to the Shemyaking & Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia, November 4-12, 2008. (*Purpose of meeting was to evaluate Russian scientists current research efforts in developing new anthrax detector technologies and report findings to the North Atlantic Treaty Organization [NATO]*)
- 2008 North Central NELD (National Extension Leadership and Development) course, session four, Salt Lake City, UT, September 24-27, 2008.
- The 103rd Annual Meeting of the North Dakota Veterinary Medical Association, Fargo, ND, August 3-5, 2008.
- Tom Noffsinger, Low Stress Cattle Handling, Jamestown, ND, August 11, 2008.
- Big Iron, NDSU Extension Display Booth, West Fargo, ND, September 8, 2008

Stoltenow, C.S. – Awards

Stoltenow, C.S. – Reviews
- Reviewer of Dr. Simon Kenyon’s dossier, Associate Professor of Veterinary Clinical Sciences, Purdue University College of Veterinary Medicine, for promotion to full professor. (*Requested by Dr. Peter Constable, Head of Veterinary Clinical Sciences*)
- Reviewer of Dr. Russ Daly’s dossier, Assistant Professor of Veterinary Science, South Dakota State University, College of Agriculture and Biological Sciences, for promotion to associate professor. (*Requested by Dr. David Zeman, Head and Chair of Veterinary Science*)

Stoltenow, C.S. – National/International
- Steering committee member for the 2nd Cross Border Livestock Health Conference (CBLHC), being held April 28-30, 2009 in Banff, Alberta. (*The Cross Border Livestock Health Conference brings together western American and Canadian veterinarians and animal health experts from state/provincial and federal governments, other areas of the*
public/private sectors and pertinent industry. The main objective is to help facilitate enhanced cross border cooperation and encourage the exchange of information between jurisdictions that might ultimately help diffuse any animal health issues that are or could eventually evolve into border access issues.

- Animal Health Legislation and Policy Specialist to Afghanistan, 2008. (Selected as an animal health legislation and policy specialist to advise the chief veterinary officer of Afghanistan by the World Bank. Declined offer because of deteriorating security situation in Afghanistan.)
- Canadian Consulate, Minneapolis, MN. (Guest of the Canadian Consulate at the International Livestock Congress, Calgary, AB, July 10-11, 2008. Represented the North Dakota Stockmen’s Association.)
- Mongolian Agriculture University and North Dakota State University with Mongolia V.E.T. NET Educational Cooperation agreement. (In collaboration with Dr. Neil Dyer, initiated, established and currently developing curriculum for a Mongolian Masters of Science Degree program within the Mongolian Agriculture University School of Veterinary Medicine. Agreement signed by President Chapman November 30, 2007.)
- Mongolian VET Net Advisory Group. (Serve as an advisor to Mongolian VET Net, a Non-Governmental Organization in Mongolia that provides veterinary continuing education and efficacious veterinary pharmaceuticals and biologics to Mongolian veterinarians, 2007 - present.)
- National Chair, eXtension Community of Practice 2008, Agrosecurity Community of Practice (Served as the Chair of the 2008 EDEN eXtension Community of Practice (CoP) Agrosecurity Team and as such supervised the creation, editing, and publishing of over 70 articles for inclusion in the national launch of eXtension in February of 2008. Personally developed five articles for publication on the web.)
- Ask-An-Expert, eXtension Community of Practice 2008, (Serve as an Ask-An-Expert for eXtension Agrosecurity Community of Practice which encompasses responding to stakeholder questions from across the country with regards to animal agrosecurity. NDSU is seen as an expert in the area of animal agrosecurity.)
- HorseQuest, Ask-An-Expert, eXtension Community of Practice 2008, (Serve as an Ask-An-Expert for eXtension HorseQuest Community of Practice which encompasses responding to stakeholder questions from across the country with regards to horses. NDSU is seen as an expert in the specialty of horses.)
- Member of the American Veterinary Medical Association.
- Member of the American Association of Bovine Practitioners.
- Member of the American Association of Equine Practitioners.
- Member of the American Association of Extension Veterinarians.
- Member of the American College of Veterinary Preventive Medicine.

Stoltenow, C.S. – State
- Executive Board Member, Member of the ND Veterinary Medical Association
- Legislative Affairs Committee Member, Member of the ND Veterinary Medical Association
- Member of the ND Stockmen’s Association
- Consulting Veterinarian, North Dakota Board of Animal Health (Serve as technical expert to this board. Provide recommendations to control and/or eradicate livestock diseases in North Dakota)
- Consulting Veterinarian, North Dakota Department of Health (*Serve as zoonotic disease expert to this state agency. Hosted two Central Asian physicians in 2003 for North Dakota Department of Health and the Centers for Disease Control and Prevention*)

Stoltenow, C.S. – Department
- NDSU Animal Sciences “Advisory Committee” Planning Committee, Chair (*Committee was formed to assess need for an Advisory Committee to the Animal Sciences Department. Formation of advisory committee was not deemed advisable at this time.*)
- NDSU Animal Sciences KQLX Radio Program Coordinator, 2008 (*In collaboration with Mick Kjar, KQLX Farm Program Director, coordinated NDSU Animal Science faculty for radio programming for the months of April and May, 2008. KQLX has the largest agriculture audience of any radio station within in the Fargo-Moorhead listening area.*)

Stoltenow, C.S. - Extension
- Beyond Borders International Animal Agrosecurity Conference, Fargo, ND, June 4-6, 2008. (*This is the first such conference developed and hosted by a University. I served as the Chair and organizer. Two hundred participants from 16 states and 4 provinces attended the conference. Participant representation included: regulatory medicine; regulatory veterinary medicine; public health; law enforcement; university and extension educators; commodity groups, producer organizations, private practitioners and producers; private industry, emergency services, and media. Survey respondents indicated an improved level of knowledge of animal agrosecurity as a result of attending the Beyond Borders conference. This gain in knowledge is illustrated by 43 percent of participants responding they had an “above average” level of knowledge of animal agrosecurity prior to attending the Beyond Borders; as compared to 96 percent after attending the Beyond Borders conference. The Manitoba Agriculture, Food and Rural Initiatives (MAFRI) offered this comment, “The information from the conference has served as a building block for the development of educational programs in Manitoba.” The North Dakota Department of Emergency Services noted they used the information gained from the Beyond Borders conference “In development and updating of the Animal Health Annex of the State Emergency Operations Plan.”)
- Canadian Foreign Animal Disease Laboratory Collaborative Exchange, Winnipeg, MB, July 28, 2008. (*This exchange involved researchers and specialists from NDSU and the University of MN. Program was conducted to explore collaborative efforts with the Canadian Food Inspection Agency [CFIA] biosecurity level 4 Foreign Animal Disease Laboratory.*)
- (*North Dakota*) “Making ‘Em Mind and Saving a Dime in “09” Cow-Calf Seminar Featuring Handling Calving Problems by Dr. Robert Mortimer and Low Stress Cattle Handling by Mr. Curt Pate. Dickinson, ND, December 9, 2008.
- (*North Dakota*) “Making ‘Em Mind and Saving a Dime in “09” Cow-Calf Seminar Featuring Handling Calving Problems by Dr. Robert Mortimer and Low Stress Cattle Handling by Mr. Curt Pate. Napoleon Livestock, Napoleon, ND, December 10, 2008.

Stoltenow, C.S. – Invited Speaker
- Stoltenow, CL. Anthrax and outbreaks, Annual Wyoming Veterinary Medical Association Conference, Laramie, WY, June 17, 2008
- Stoltenow, CL. Anthrax, Cheyenne Veterinary Medical Association, Cheyenne, WY, February 20, 2008
- Assisting Mongolia in Governing a Free Market System, World iView Speakers Series, Office of International Programs, North Dakota State University, Fargo, ND, April 17, 2008

Stoltenow, C.S. – Radio and TV
- Equine Encephalitis, interview by Mick Kjar, KQLX, July 8, 2008
- Anthrax in ND bull, interview by Al Gustin, KFYR, June 18, 2008
- Beyond Borders Animal Agrosecurity Conference, interview by Mick Kjar, KQLX, June 9, 2008
- Interstate movement of animals due to drought, interview by Todd McDonald, Prairie Public Radio, April 23, 2008
- Anthrax in Minnesota, interview by Mick Kjar, KQLX, April 22, 2008
- Beyond Borders Animal Agrosecurity, interview by Mick Kjar, KQLX, April 15, 2008.
- TB in Minnesota Cattle, interview by Al Gustin, KFYR, April 9, 2008
- Anthrax in cattle and the need to vaccinate, Al Gustin, KFYR, April 4, 2008
- Hardware disease in cattle from old tires, interview by Sarah Gustin KXnetwork, April 3, 2008

C.S. Stoltenow coordinated design and purchase of Animal Science Extension shirts for extension specialists.

C.S. Stoltenow advised Dean Thiel from Traill County Farm Services on heat stroke in cattle regarding an insurance claim, September 2, 2008.

T.J. Swanson attended the American Collegiate Horsemen’s Association National Meeting 1/24-1/27, 2008.

T.J. Swanson became an inductee into Gamma Sigma Delta.

Swanson, T.J. - National/International
- Animal Science Image Gallery Reviewer

Swanson, T.J. – Regional
- IHSA Standards and Ethics Committee Zone 9 Region 3
Swanson, T.J. – College
- Equine Committee

Swanson, T.J. – Planned Extension Activities
- Co-coordinator and speaker, Girl Scout Camp, March 2008: 75 attendees
- Advisor, Fuzzy Wuzzy Horse Show, March 2008: 50 attendees
- Advisor and speaker, NDSU Horse Fair, April 2008: 800 attendees
- Coordinator and speaker, Horsemanship Camp, June 2008: 8 attendees
- Co-coordinator and speaker, 4-H Judges Certification Program, September 2008: 15 attendees
- Coordinator and speaker, Wish I Had a Horse Camp, October 2008: 40 attendees

Swanson, T.J. – Other Extension
- Little I Showmanship Demonstration, Fargo, ND, February 2008
- Little I Hippology Contest, Fargo, ND, February, 2008
- Winter Show Hippology Contest, Valley City, ND, March 2008
- State FFA Judging Contest, Fargo, ND, June 2008
- NDSU Conversations Across the Land, Mooreton, ND, June 2008
- Cass Co. 4-H Horse Show, Fargo, ND, June 2008
- Richland County 4-H Camp, Hankinson, ND, June 2008
- ND 4-H State Fair Horse Show, Minot, ND, July 2008

Vonnahme, K.A. – Professional Meetings
- Midwestern section of the American Society of Animal Science: Invited speaker, member of Quadrathlon committee, member of Physiology Committee
- NC1036 meeting: Reproduction in Cattle.

K.A. Vonnahme received 2008 Early and Dorothy Foster Excellence in Teaching Award.
College of Agriculture, Food Systems and Natural Resources, early career award in teaching.

Vonnahme, K.A. – Reviews
- Animal Reproduction Science (2)
- Biology of Reproduction (1)
- Domestic Animal Endocrinology (1)
- Endocrine (1)
- Journal of Animal Science (3)
- Pediatric Research (1)
- Reproduction (1)
- Theriogenology (1)

Vonnahme, K.A. – National/International
- American Society of Animal Science: Triannual Reproductive Symposium
- Society of the Study of Reproduction: Membership committee

Vonnahme, K.A. – Regional
- W112: Reproduction in Domestic Ruminants
- NC1036: Reproduction in Cattle
- Midwestern Section of the American Society of Animal Science; Physiology Committee, Quadrathlon Committee

Vonnahme, K.A. – University
- University Senate Member
- WISMET
- Mentor for STEM

Vonnahme, K.A. – College
- CAFSNR representative to University Senate
- CAFSNR “Women in Ag” luncheon organizer

Vonnahme, K.A. – Department
- Quadrathlon Committee Chair
- Animal Science Showcase
- Swine Committee
- Recruitment, Retention, Placement and Curriculum Committee
- Library Committee Chair

Vonnahme, K.A. – Extension
- Invited Speaker; Rolette County Beef Days. Belcourt, ND. Reproductive Anatomy, Physiology, and Estrous Synchronization. February 12, 2008.
- Presenter; Richland County 4-H Tour, Fargo, ND. Embryo development and Ultrasound in Beef Cattle. January, 12, 2008.

Vonnahme, K.A. - Magazine

S.A. Wagner attended the Minnesota Veterinary Medical Association Annual Conference, Minneapolis, Minnesota, February 2008.

S.A. Wagner attended the American Association of Bovine Practitioners 41st Annual Meeting, Charlotte, NC, September 26, 2008

Wagner, S.A. – National/International
- American Veterinary Medical Association, Committee on Veterinary Technician Education and Activities, 2007- present, Representing Large Animal Practice
- American Association of Bovine Practitioners
  - Committee on Pharmaceutical and Biological Issues, January 2003 – September 2008
  - Committee on Lameness, September 2008- present
- American College of Veterinary Clinical Pharmacology
  - Exam Committee Member, 2006-2008

Wagner, S.A. - University
- Committee Member 2004-2008, Institutional Animal Care and Use Committee, North Dakota State University

Wagner, S.A. - Department
- Committee member, Department of Animal Sciences Dairy Committee 2004-present
- Committee member, Department of Animal Sciences Awards Committee 2004-present

2. **Alumni events and other community-related activities**

During the past year, department faculty participated in the NDSU College of Agriculture, Food Systems, and National Resources Harvest Bowl Banquet, Student Scholarship Luncheon, College Awards Ceremonies, and various other related events. The department also continued the Animal Science Showcase which was initiated in September 2007. Alumni were invited for a weekend, in conjunction with a football game, of activities at Oak Grove Park and Shepperd Arena.

3. **Fund-raising accomplishments**

The Veterinary Technology Program was the beneficiary of recent donations from a private couple and the (Fargo-Moorhead) Metropolitan Veterinary Medical Association totaling $25,100. The donated funds are being used to purchase high priority equipment items, and add a second outdoor cat run to Robinson Hall.

4. **Other outreach activities**

Department faculty participate in numerous outside activities each year. For example:

a. Dr. Larry Reynolds is Editor-in-Chief of the Journal of Animal Science.
b. Dr. Greg Lardy is Associate Editor, Journal of Animal Science.
c. Dr. David Buchanan was on the Board of Directors – Federation of Animal Science Societies (term completed in Sept 2008).
d. Professor Russ Danielson serves on the Research and Promotion Committee of the N.D. Stockman’s Association.
e. Professor Russ Danielson acts as the secretary/treasurer of the N.D. Livestock Endowment Foundation.
f. Dr. Eric Berg was Chairman for the annual Reciprocal Meats Conference.
g. Dr. Thomas Colville is a member of the Fargo-Moorhead Humane Society Board of Directors.
h. Dr. Thomas Colville is the Consulting Veterinarian, American College of Surgeons Advanced and Pediatric Advanced Trauma Life Support Course.
D. Special Initiatives

1. Cooperative programming/interinstitutional activities

As outlined in section A. 6. the department provides academic coursework to Dickinson State University through distance education. Professor Danielson participates in planning efforts for agriculture curricula at other colleges in the state.

2. International activities

Dr. Grazul-Bilska collaborated with researchers from three scientific groups from abroad, including the University of Heidelberg in Germany, the University of Teramo in Italy, and the University of Saskatchewan in Canada.

Dr. Wagner received a seed grant from the USDA National Research Initiative to collaborate with Canadian researchers on the effects of pain-relieving drugs in lame dairy cows.

Dr. Stoltenow hosted the 2008 Regional International Animal Agrosecurity Conference held in Fargo in June. Participants from four provinces and 16 states attended. He attended the International Livestock Congress held in Calgary, Alberta, in July representing the ND Stockmen’s Association. Dr. Stoltenow also conducted a site visit for NATO to the Shemyakin & Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia in November 2008; the purpose was to assess progress on an anthrax detector development project.

Drs. Dale Redmer, Larry Reynolds, Joel Caton, and Pawel Borowicz have been continuing studies in the area of nutritional interactions associated with fetal and placental growth during various stages of pregnancy. Redmer, Caton, and Borowicz have traveled to Aberdeen, Scotland this spring to conduct experiments. Their work is being conducted, in part, as a long-term collaboration with the Rowett Institute of Nutrition and Research (RINR), University of Aberdeen, Scotland.

Drs. Pawel Borowicz and Dale Redmer traveled to Lublin, Poland to investigate collaborative research opportunities with Dr. Radoslaw Radzki, Department of Biochemistry and Physiology, Veterinary Medicine Faculty, University of Life Sciences, regarding use of high resolution magnetic resonance imaging for analyzing 3-dimensional casts of vascular beds made from placenta.

Drs. Redmer, Reynolds, and Borowicz are continuing collaborations with Dr. Shireen Hafez, Faculty of Veterinary Medicine, Alexandria University, Egypt in work designed to further study vascular growth. Recent collaborations involve the exchange of technology and experiment samples in an effort to better understand the regulation of the reproductive system.
3. **Interdisciplinary activities**

International interdisciplinary activities were centered around the Center for Nutrition and Pregnancy (CNP) as detailed in Section D. 3. The goals of the CNP are to perform cutting edge nutritional research that promotes fetal and neonatal growth, provided a mechanism for coordinated research and training programs in nutrition and pregnancy, and deliver leadership training for students and clinicians in research and education. The CNP has participation from ARS faculty; Food and Nutrition faculty; University of Wyoming and Nebraska faculty; the USDA in Dubois, Idaho and Grand Forks, ND; faculty from the University of Teramo, Italy; and researchers from the Rowett Research Institute for Nutrition, Aberdeen, Scotland.

4. **Economic development efforts**

The department’s major economic development activity continues to be the Beef Systems Center of Excellence (BSCOE). The BSCOE has objectives for North Dakota of:

- Economic development of the livestock industry
- Build the research capacity of beef cattle
- Increase educational opportunities for livestock producers and students

The Center’s private business partner completed construction and renovation of a beef processing, fabrication, and distribution center near the NDSU campus. This facility will be capable of processing approximately 50,000 head of beef and bison annually. The company is currently harvesting about 100 head of cattle per week. Department faculty have been instrumental in assisting the company in several areas including: 1) sourcing fed cattle and identification of potential suppliers, 2) assistance with the development of HACCP plans and troubleshooting food safety issues, 3) development of specifications for the program, and 4) sourcing additional grant funds for market research. When fully implemented the company’s business plan calls for purchasing 25,000 head of fed cattle (valued at approximately $32 million dollars). In addition the company will employ approximately 100 people at its Fargo location. The company has developed custom processing ventures with several beef marketers in the region.

5. **On-line courses and programming**

Most of the courses in the department use Blackboard for availability of course materials and communication. The department has on-line courses, at least in that limited sense. There are not any stand-alone on-line courses in which students may enroll and proceed at their own pace. Discussions have initiated concerning developing such classes.

E. **Planning**

1. **Future plans**

We need to successfully conclude searches for personnel, including the Head and faculty positions. Since 2000, the department has had two “permanent” Heads for a total of about 3
years.

Current students advised in the department total over 300. Our goal is to increase student members. Plans to expand and diversify the study options are critical to the successes of recruiting. New study options can increase the range of students with an interest in the department and will also provide marketing opportunities that make our programs more appealing to prospective students.

Research programs will continue to emphasize more fundamental areas of research centered on the general area of developmental programming as well as more applied research in beef, dairy, sheep and swine nutrition, physiology and management. The addition of new faculty members in the meats area and development of the Beef Center Systems of Excellence is facilitating expanded research in that discipline.

2. Program strengths

The program has a great many strengths. The teaching program is well known in the state and regionally. There is a good combination of senior faculty who have shown teaching excellence for many years and younger faculty who have already developed reputations as excellent teachers. A rapidly developing teaching strength is the equine program with four faculty members and programs in equine nutrition and physiology, therapeutic riding, equine evaluation and general horsemanship and riding. The Veterinary Technology Program continues to be recognized nationally, and is now attracting international students.

The research program is an international leader in the area of developmental programming as pursued by the participants in the Center for Nutrition and Pregnancy. Additionally, the Beef Systems Center of Excellence is a new strength in the department with faculty who pursue research in meats and beef management. In addition to these centers, the department has excellent research programs in dairy nutrition and management, beef nutrition, management and physiology and sheep production. Opportunities for collaboration with the Research-Extension Centers also provide a plus for the department in both beef cattle and sheep research.

3. Future challenges

The departmental challenges are common to most academic units on the NDSU campus. We are extremely short of space: offices for faculty, staff and graduate students; laboratories for research and teaching; classrooms for academic programming; and land to provide for the livestock at the departmental farm units. We are also in great need of repair and update of facilities. Funds that should go to support academic activities are being siphoned off to maintain an aging infrastructure.

A common challenge for departments of animal science around the country is the difficulty of balancing the changing demands of teaching, research and extension programs. The three missions are moving in somewhat different directions. Extension efforts must focus increasingly on providing very high level support to large production units while still maintaining contact with the many producers with small herds and flocks. Students coming
to departments such as this one are increasingly interested in animals other than traditional farm livestock and they require different types of programs. These teaching and extension changes must be balanced with the need to do interdisciplinary research that is increasingly fundamental in nature but still meet the practical demands supplied by a changing livestock industry.

Budgets need to be increased. A large and dynamic faculty with many teaching, research and extension interests need to have resources. The opportunity to use the equipment money made available by the legislature during the past biennium has been a nice chance to obtain new equipment but much more is needed. We face considerable uncertainty in the future of departmental livestock programs because of the large changes in input costs, which are similar to those of our clientele.

4. The overall unit

The Department of Animal Sciences contributes to NDSU’s position as a comprehensive university (B.S., M.S. PhD programs and highly regarded teaching, research and outreach programs), a land-grant university (serves agriculture in the state, region, nationally and internationally through teaching, research and extension) as well as its emerging importance as a national research university (internationally known research program in developmental programming as well as important research programs in nutrition, physiology and food science pertaining to animals and products of the beef, dairy, sheep and swine industry). Undergraduate degree programs in Animal Science, Equine Science and Veterinary Technology are all meeting needs for training young people for dynamic job markets.
## F. Enrollment and FTE data

### Animal Sciences Course Enrollment

<table>
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<th>Course Number &amp; Title</th>
<th>Fall 2008</th>
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<tr>
<td>114  Intro/Animal Science</td>
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<td>Danielson</td>
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<tr>
<td>123  Feeds &amp; Feeding</td>
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<tr>
<td>123  Feeds &amp; Feeding</td>
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<td>48</td>
<td>Bauer</td>
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<td>196  Field Experience/Little I</td>
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<tr>
<td>220  Production of Meat Animals</td>
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<td>222  Meat Animal Evaluation</td>
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**VETS**

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G. Other relevant data and materials

Impact statement

Berg, E.P.
- I have been an integral member of the Animal Science faculty. I have contributed as a leader and team player in the development of Meat Science curriculum and programmatic criteria through local, national, and international presentations, graduate student recruitment, and scientific publication.
- My research focuses on the influence of environment, nutrition, and genetic factors as they impact meat-animal production efficiency, health, carcass composition, and meat quality. I have worked very hard to establish a domestic and international reputation for research in this area of specialty and feel that I have gained considerable headway toward achieving this goal. The progress toward that goal was, in part, described above with regard to attracting and placing successful graduate students. I have been listed as PI, Co-PI, or collaborator this last year on $350,102 worth of competitive grants. Unfortunately, many of these grants were not accepted for funding.

Berg, E.L.
-During my first year at NDSU I played an integral role in establishing a mutually beneficial partnership between the Equine Studies Program and Riding on Angels’ Wings Therapeutic Horsemanship Program. This community based non-profit organization provides equine assisted activities and therapies to individuals with disabilities. Students enrolled in the Therapeutic Horsemanship courses have a unique opportunity to participate in various ways with this exceptional program, gaining valuable knowledge while giving back to the community.

-While not reflected in publications, my research efforts are being focused on innovative teaching strategies as well as the effects of equine assisted activities and therapies on humans and horses. I believe these efforts have the potential to positively benefit the health and well-being of both human and equine populations in ND.

Berg, P.T.
- The focus and impact of my current and proposed research is to improve demand for animal protein products and thereby improve the economic status of producers within North Dakota and the region.

Buchanan, D.
- Efforts pertaining to the genetic improvement of livestock have considerable potential economic benefits to the livestock industry and to consumers. A clear understanding of genetic principles is highly important at the present time to Angus producers, in particular, due to the emergence of Arthrogryposis multiplex, a genetic condition, as a threat to important bloodlines in that breed. The development of genetic markers which can be used within the livestock industry (particularly in the beef and dairy industries) also make understanding of genetics highly crucial.

Maddock Carlin, K.R.
-My research in meat science and muscle biology has important implications:
  ○ Because utilization of field peas in feedlot diets may impact tenderness of beef. Tenderness is
the most important palatability trait of beef and may provide a means of providing a guaranteed tender beef product to consumers. Additionally, North Dakota produces more field peas annually than any other state, and demand for field peas may be impacted if found to improve meat quality.

- Maternal nutrition has huge impacts on offspring growth. The impacts on muscle growth, and subsequent carcass composition and meat quality may be economically measurable as well as have implications of maternal nutrition in human growth and development as it pertains to growth of offspring.

Colville, T.
- Among the 154 veterinary technology educational programs in the United States and Canada that are accredited by the Committee on Veterinary Technician Education and Activities of the American Veterinary Medical Association, the NDSU Veterinary Technology Program is one of only 18 that offer the Bachelor of Science degree. This attracts students from around the country in addition to students from North Dakota and the surrounding region. The vet tech professional program also has two international students currently enrolled – one from Malaysia and one from Canada.

- The Veterinary Technology Program offers students interested in careers in animal health care an educational alternative to pursuit of a veterinary degree. The complexity of modern-day animal health care has resulted in the veterinary profession moving increasingly toward the development of the animal health care team concept. The animal health care team consists of veterinarians working with skilled veterinary technicians, and other aides and assistants. The education students receive in the NDSU Veterinary Technology Program fosters the development of professional knowledge, manual skills and critical thinking in the context of a complete university Bachelor of Science education. According to the 2007 Veterinary Technology Program Graduate Survey, graduates of the program are spread over 26 states, but more than 72% of the survey respondents are located in North Dakota, South Dakota and Minnesota. Responses from the 2008 graduate survey are currently being compiled.

- Through the Robinson Hall Veterinary Wellness clinic, Veterinary Technology Program students and staff provided wellness services to animals from the F-M Humane Society and the Red River Zoo. In the fall of 2008 Veterinary Technology Program faculty, staff and students participated in the spaying of a Gray Fox, and the neutering of four Gray Wolves from the Red River Zoo.

- Through its graduates, the Veterinary Technology Program contributes to improving the quality of animal health care in North Dakota, the upper mid-west region and across the country. This impacts the public through improved prevention, diagnosis and treatment of livestock and companion animal diseases and injuries.

- Veterinary Technology Program staff members contribute to the advancement of veterinary technician education and the veterinary technology profession in general. Two program staff members are past presidents of national professional associations – the Association of Veterinary Technician Educators (Thomas Colville and Teresa Sonsthagen) and the National Association of Veterinary Technicians in America (Teresa Sonsthagen). All program staff members have authored all or part of veterinary technology textbooks and other educational resources.
Grazul-Bilska, A.
- The results of my research program will help to enhance reproductive efficiency, which may have a direct impact on reducing high input costs to the animal industry. Development and establishment of an animal embryology program and animal embryology laboratory at NDSU will bring these new technologies to North Dakota, and make them available for practical on-farm use. The immediate practical impact of this research is that it will enable the development of practical methods of assisted reproductive technologies (ART) that will serve the animal agriculture industry in North Dakota. The practical and economical merits of ART in the domestic animal industry include not only improvements in reproductive efficiency, but also in the breeding improvement programs through use of embryos with specific genetics (e.g., sex selection on dairy farms), importation and exportation of animals in the form of frozen embryos, production of transgenic animals with highly desirable genes, etc. Having this technology available in North Dakota will open up these specialized markets to North Dakota producers. In addition, the proposed activity will help to generate preliminary data to apply for grants from outside sources, and recruit undergraduate and graduate student researchers. Therefore, the impact of a strong research program in this area will strengthen our teaching program by bringing these new biotechnologies to North Dakota students.

In summary, these proposed studies will enhance our research, teaching, and outreach activities, which in turn should have a major impact on the livestock industry and economy of North Dakota.

Hammer, C.
- Extension efforts will help ND horse owners improve their quality of horse care and increase owner knowledge resulting in higher performance and enhanced economic potential
- Promotion of the ND horse industry will increase awareness of opportunities and business potential within the industry
- Research efforts will enhance understanding of immunoglobulin transport and absorption resulting in improved neonatal health

Lardy, G.P.
- The ethanol industry is expanding rapidly. My research and extension program has focused on maximizing utilization of byproducts from ethanol production in beef cattle and sheep diets. Our research (in conjunction with Hettinger REC) has investigated the issue of sulfur toxicity when feeding high levels of distillers grains plus solubles. Our work indicates up to 60% of the diet can be fed (0.8% sulfur) with little problem in lambs. This work has helped increase the understanding of sulfur toxicity and increased utilization of distillers grains plus solubles in North Dakota cattle and sheep operations.
- Extension programming efforts have also focused on disseminating the results of the research we and others have conducted and is a critical component of my position. Over 25% of my extension programming deals directly with the impacts of the ethanol industry on beef cattle production or how to feed the byproducts which result from ethanol production. Over 550 people attended these workshops. Many others received the information in the form of newsletters, press releases, and extension bulletins.
Luther, J.
- My extension and research efforts deliver enthusiasm and modern knowledge to North Dakota sheep producers. Since my research background and current focus is on reproductive physiology in sheep, these efforts will enhance income of ND sheep producers through increased reproductive efficiency. Furthermore, my active involvement with state and national sheep committees will aid in making NDSU’s Sheep Extension and Research Program one of the top sheep programs in the nation.

Maddock, R.J.
- Adding value to livestock production by improving end product quality will result in greater economic returns to livestock producers and meat processors. By conducting relevant research and providing timely information to stakeholders, a noticeable improvement in the quality and value of meat products will result.

Park, C.S.
Area 1. Nutritional Strategy for Animal Development and Epigenetic Control of Lactation:

The economic future of livestock (beef and dairy) operations depends largely on a sound rearing program for replacement heifers. Successful heifer rearing, in turn, is determined by efficiency of heifer growth and, more importantly, their subsequent lactation potential. An effective replacement heifer program is vital to farm profitability.

For nearly 20 years, our laboratory has been investigating the use of a stair-step compensatory growth feeding regimen to improve lifelong heifer production. The basic concept of this regimen is to reduce energy levels [restriction phase] at times when heifers are not as likely to put it to good use (e.g., early to mid-gestation) and to push energy [realimentation phase] when the animal can make the best use of it (e.g., late gestation). Heifers raised on our stair-step nutrition regimens exhibit enhancements in 1) growth efficiency, 2) mammary gland development with improved lactation performance over two or more lactations, 3) prepartum metabolic and immune status, and 4) reproductive performance in first calf dairy and beef heifers.

**Animal agriculture.** Dairy heifers reared on compensatory nutrition regimens have at least a 10% enhancement in lactation performance which carries through to subsequent lactations. If heritable genes regulating milk synthesis are identified, the possibility exists to manipulate genes to further improve lactation as well as the longevity of lactation. An increase in lactation efficiency may increase profits without increasing cow number which has economical as well as environmental impact (e.g., land use).

**Human health.** Findings from these studies may facilitate future studies on a broad range of biological pathways regulating proliferation, functional differentiation, and apoptosis of the mammary cell. By establishing a correlation between nutrition and development of the mammary gland, we may be closer to controlling lactation potential. Also, the ability of compensatory growth-directed and gestation-specific mammogenesis to influence epigenetic changes in the expression of genes regulating milk synthesis may aid in developing practical means of enhancing quality and quantity of milk (e.g., infant health, the secretion of certain immunoglobulins or growth factors) as well as longevity of lactation.
In addition, the degree of development of specific lobular types is highly associated with a susceptibility to carcinogenesis; fuller differentiation of lobules is considered to have anticancer activity. If compensatory mammary growth during the first pregnancy alters DNA methylation and stimulates full mammary cell differentiation, then this information could potentially be used to develop improved maternal diets that may help to prevent and reduce the breast cancer risk.

**Future studies.** We have established that the stair-step compensatory nutrition regimen has lasting effects on mammary development, differentiation, and lactation. Thus, the principal challenge will be to document the extent to which nutritionally directed compensatory mammary hyperplasia induced once during the first gestation affects methylation status thereby producing stable epigenetic changes in genes with the result being a metabolic imprinting process.

**Area 2. Basic Mammary and Cancer Biology:**

We have been studying the role of dietary methyl donor nutrients (choline, methionine, folic acid, and vitamin B12) in epigenetic control of mammary development and tumorigenesis. A dietary strategy that increases the supply of methyl donors may have practical applications in cancer treatment. If dietary supplementation of lipotropes induces apoptotic death of mammary cancer cells, then there is a possibility of developing a dietary regimen that may reduce and treat breast cancer.

**Area 3. Canola Oil and Mammary Cancer:**

Recent evidence suggesting that not all dietary fats are associated with an increase in breast cancer risk has ignited the need for adequate research to determine which vegetable oils are associated with a decrease in breast cancer risk. We are currently conducting a study to determine the effect of canola oil on breast cancer risk. Findings from this project are very essential to create new markets for the canola industry. This may help augment the economic benefits for existing producers while also pushing production due to high consumer demand.

Redmer, D.A.

- Recent work regarding Objective 1 on ovarian function has shown that: 1) Expression of FSHR in fetal ovaries was greater in ewes fed maintenance than restricted diets. Thus, maternal nutrition affected expression of FSHR in fetal ovaries, indicating that plane of nutrition instead of dietary Se concentrations plays a regulatory role in fetal follicular development. 2) That expression of LHR and mTOR depends on the stage of luteal development, differentiation, and regression, and that PGF regulates LHR and mTOR expression during luteolysis. This discovery of a control of mTOR expression by PGF may help to establish new therapeutic strategies in tissues regulated by PGF and improved methods to influence fertility in humans and livestock species. Work regarding Objective 2 on placental growth has shown that: 1) There were no differences in the rate of cell proliferation of the trophoblast in single cell nuclear transfer (SCNT) vs. IVF. However, VEGF mRNA expression was less in the fetal membranes of SCNT than IVF on day 40 of pregnancy. The mRNA expression for KDR and FLT were similar in SCNT and IVF. Overall, these data suggest that the lower expression of VEGF, a major placental angiogenic factor, in fetal membranes of early pregnant SCNT fetuses may be an early
biomarker for the development of hydrops placenta later in pregnancy. 2) Reductions in fetal wt may be due to altered placental function including glucose transport and/or blood flow. 3) That FGF2 and receptor FGFR2 IIIc have a role in regulating early placental growth and will help us to determine which compartments of the placenta are altered in compromised pregnancies. 4) That a complex picture of AF/AFR involved in the nutritional mediation of placental vascular growth is emerging. Future studies examining protein expression for AF/AFR are requisite to an improved understanding of the mechanisms by which placental vascular growth can be altered by maternal dietary intake during pregnancy. 5) That high dietary intakes negatively impact placental proliferation by the end of the first third of gestation and this may ultimately contribute to the reduction in placental mass observed by the final third of gestation in the overnourished adolescent paradigm. 6) That during early pregnancy vascularization of the endometrial tissues increases dramatically after day 24, and endometrial vascular development parallels the changes in expression of protein for FGF2 but not FGFR2 IIIc receptor. It therefore seems likely that FGF2 plays a role in regulating uteroplacental vascular and nonvascular growth during early pregnancy which will ultimately enable us to determine whether uteroplacental expression of this growth factor is altered in compromised pregnancies. 7) That late gestation E2 concentrations are negatively associated with maternal gestational live weight gain and may reflect differences in metabolic clearance rate as well as placental secretion and supports the hypothesis that nutritionally-mediated suppression of estrogen may partly underlie impaired fetoplacental growth restriction in growing adolescents, definitive proof via E2 supplementation is required.

- Refereed Journal Articles – There are numerous articles in this report that are also in the Faculty Update, please see CV or CRIS Website.

Reynolds, L.P.

- Production of animals for meat is a multi-billion dollar industry in the U.S. alone. Income from the sale of animals, feed consumed by animals, and meat consumed in the U.S. is, conservatively, a quarter of a trillion dollars per year1,2. Because the costs of maintaining reproductively sound females is a primary expense for livestock producers, reproductive failure remains one of the most limiting and costly problems facing the livestock industry2,3,4. Thus, methods to improve reproductive efficiency would have a major impact on the profitability of animal agriculture2,3,4.

- Beyond that, the world’s population is expected to continue its explosive growth and is conservatively expected to double from its present 6 billion to nearly 12 billion by 20505,6. Along with world population growth will come a large increase in the demand for meat and milk products7,8. Thus, the efficient production of animal protein, especially from low-quality forages, should remain a driving force for agricultural research8,9,10,11. Understanding the mechanisms controlling reproductive efficiency of farm animal therefore has important economic as well as social implication for North Dakota, the nation, and the world.

- The placenta is the organ through which all of the nutrients, respiratory gases, and wastes are transferred between the maternal and fetal systems12,13. Thus, normal growth and development of the fetus depends on an adequate blood supply to the placenta. Normal fetal growth and development, in turn, are critical determinants of postnatal survival as well as long-term health and productivity of the offspring. Dr. Reynolds' research emphasizes the mechanisms regulating placental growth and vascular development (angiogenesis), using in vivo and in vitro (including histological) approaches.

- Dr. Reynolds' research focuses on the mechanisms regulating placental growth and vascular development (angiogenesis), using in vivo and in vitro (including histological) approaches. His research career has extended over 3 decades, and he is widely recognized as one of the world's
leading placental physiologists. In addition, throughout his research career, Dr. Reynolds has made important contributions to our understanding of the effects of nutrition during pregnancy on fetal and placental growth and development. These accomplishments are summarized in several recent invited reviews (see references 12 through 16, below).

- The long-term goal of Dr. Reynolds’ research efforts is to provide an optimal uterine environment to ensure maternal, fetal, and postnatal health in humans and livestock. His current research is focused in 3 areas: (1) Further characterizing placental vascular growth at the light and electron microscopy levels, with the goal of developing robust mathematical and physical models of the influence of changes in placental vascular architecture on placental function in normal and compromised pregnancies; (2) Evaluating placental growth and vascular development of in vitro produced embryos, including in vitro fertilized and cloned embryos, with the goal of understanding the basis of altered placental function leading to a high rate of abnormal embryonic development and death in these pregnancies; and (3) Investigating the use of modulators of placental vascular growth and function as therapeutic tools in the management of compromised pregnancies, with the goal of minimizing fetal growth restriction and loss.

Current collaborators in these efforts include: Drs. Steve Ford, Bret Hess, and Peter Nathanielsz, the University of Wyoming; Dr. Shireen Hafez, Alexandria University, Egypt; Drs. Greg Lewis and Brett Taylor, the U.S. Sheep Experiment Station, Dubois, ID; Drs. Lino Loi and Grazyna Ptak, the University of Teramo, Italy; Dr. Norman Rawlings, the University of Saskatchewan; Dr. Sergio Soto-Navarro, New Mexico State University; and Dr. Jacqueline Wallace, the Rowett Research Institute, Aberdeen, Scotland.

References Cited:
Schroeder, J.W.

Dairy Diagnostic Program Assists Producers

The situation
Dairy farm families have witnessed the rise and fall of record high milk prices, as well as recording-breaking expenditures. Managing multiple enterprises, as is common on many dairy farms, requires knowledge ranging from business operations to biology to leadership. The North Dakota Dairy Diagnostic program helped dairy families develop management skills and utilize an advisory board to optimize short- and long-range decisions to attain farm and family goals. Advisers are chosen based on the mission and goals of the dairy operation. Team members are responsible for providing support on a variety of decisions that will determine farm financial success.

Extension response
Dairy diagnostic advisory teams guide managers and their families to improve their business and life-style. These experts serve as a board of directors who share in the goals and objectives of the farm. A team leader who holds the decision makers accountable guides the process. The team meets periodically to conduct a business SWOT (strengths, weaknesses, opportunities and threats) analysis and monitor progress. The dairy diagnostic coordinator conducts and facilitates regularly scheduled team meetings

Impacts
Dairy farm families implement skills and technological advances in feeding, breeding, business and management for greater profitability and business satisfaction. Numerous dairy farms in North Dakota have enrolled and graduated from the Dairy Diagnostic Advisory experience. Examples of results from team-directed decisions and their impact are:

- Expanded milking herd by 100 head without experiencing typical production losses in the transition. Annual impact: $394,200 of additional gross income.
- Diagnosing and correcting ration problems reduced the incidence of left-side displaced abomasum surgeries by 87.5 percent. Annual impact: $24,000 reduction in veterinary charges.
- Decreased incidence of salmonella infection in newborn calves from 40 percent to 5 percent. Annual impact: $24,000 in decreased in health-related costs and animal losses.
- Implemented management changes that lowered direct and overhead expenses from $17.82 to $16.48 per hundred pounds of milk. Annual impact: $73,365.

Feedback
Advisory teams give careful consideration to dairy producers’ specific values, desired objectives and unique abilities. Effective team members admit that they, too, have learned more about the many dynamics of the dairy business. Team member with a stake in a dairy business’ success are motivated to enhance the business so they may establish a productive business relationship in the future. Ultimately, the farm manager is responsible for managing the farm team. Together, effective teams divide the work and multiply the results, making all participants more effective and efficient.

Stoltenow, C.L.

- Over $1 billion worth of trade crosses the US-Canadian border each day. Neither country can afford to have the border closed due to an animal agrosecurity event. The Beyond Borders International Regional Animal Agrosecurity Conference provided a forum for Extension personnel to learn about animal agrosecurity and in turn provided a forum for other organizations, agencies and allied groups to learn about the capabilities of Extension. It also provided a basis for international collaboration between local emergency response agencies. Of the six regional animal agrosecurity conferences held nationwide, the Beyond Borders conference in Fargo was the best attended and had the highest attendee satisfaction. Potential impact from this conference is approximately $1 billion dollars a day for every day the border
stays open during an animal agrosecurity event involving the border.

Swanson, T.
As the Equine Studies major continues to grow new classes are needed to better prepare our graduates for the industry. In 2008 I implemented a new class ANSC 496 Equine Industry Study Tour which traveled to Kentucky for six days. This class introduced students to different aspects of the equine industry then what they may be exposed to here in North Dakota. Students were able to get a feel for different disciplines within the industry and able to interact with people who have been very successful doing what they enjoy. Students asked many questions and got a lot of valuable feedback from the tour locations about potential jobs, preparation and schooling needed to be successful in each field. I feel this trip had a big impact on the students and also opened some potential doors for internship or employment opportunities. In the future I would like for this trip to be broadened to travel to not only different regions within the U.S. but eventually an international tour would be a new and exciting experience.

For the next year I would like to start work on an on-line version of my ANSC 260 class Introduction to Equine Studies. This class gives good insight into a large majority of the topics within the equine industry and would be beneficial for not only the student population but also people within the community and across the state.

In an effort to improve the North Dakota 4-H Horse Program we have been diligently working on re-writing the 4-H Rulebook and also introducing a judges certification program to better educate not only the youth and leaders but also the judges about the rules and procedures within the horse project. In an attempt to expand on these improvements I would like to work towards a levels testing program. This program will give the youth more guidance in terms of preparation and knowledge needed to be successful. I think with all of these improvements we will build a stronger extension program within the state.

To go along with this improvement as part of my professional development in the upcoming year I would like to attend the AQHA Novice Judges Seminar and become a carded AQHA judge. By doing this it will not only make me a more knowledgeable instructor for my evaluation classes but will improve the information I am able to pass on in clinics and to the 4-H judging candidates.

Over the past year the effort has been made and very readily received to offer more equine educational clinics and events. Various clinics have been given at the Equine Center to help educate current equine enthusiasts but also to introduce new potential industry participants to not only the equine species but also to the NDSU Equine Studies Program. As the program grows and we are able to continue to promote both the species and the program I think we will continue to see interest and enthusiasm about the future.

Vonnahme, K.
My research in reproductive biology and development programming has important implications:
Because early gestation is a crucial period for placental and fetal growth and differentiation, maternal nutrition during this critical period has a real potential to impact subsequent growth rate and carcass composition of their calves/ lambs. The long term goal is to determine how calves/ lambs born from dams receiving different diets during gestation, perform in the feedlot.
Alterations in placentomal vascular development and function may impact nutrient delivery to the growing fetus, potentially affecting the subsequent health, growth efficiency and carcass quality of their offspring, which will have direct relevance to the US beef industry. Nutrition during pregnancy may also impact the developing mammary gland, impacting the health and development of the neonate. Decreased growth rate and sub-optimal carcasses cost feedlot producers millions of dollars annually. These data will undoubtedly lead to a better understanding of factors limiting in utero fetal growth and development, which could lead to reduced offspring health, production efficiency and longevity.

Wagner, S.

In 2008, I began to achieve the goals I had set myself for the Pharmacology class (VETS 357), transitioning from the lecture-based format of the previous instructor to a class with more out-of-class and active learning. My increasing familiarity with this new approach are reflected in improved instructor rating this year as compared to last year for the course; I am hopeful that course ratings and performance of students on their licensing exam will also improve in the future.

I received a seed grant from the USDA for collaboration with researchers in Canada. This project will increase the scope of NDSU research. In addition, I have presented the results of my research in peer-reviewed journals, at professional meetings, and in a dairy trade publication. Researchers, veterinary practitioners, and dairy producers have been provided with information gained from NDSU research and increased awareness of NDSU as a research institution.
## ANIMAL SCIENCES DEPARTMENT

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### Student Rating of Instruction --- Course Level Summary Report

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Frequencies (top row) and percents (bottom row) are provided to the right of each question. S.D. is the Standard Deviation and #R is the Number of Valid Responses.

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North Dakota State University Annual Report Information
Student Rating of Instruction --- Course Level Summary Report
Report Generated on 29JUN09 Using Data from Fall 2008 & Spring 2009

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Frequencies (top row) and percents (bottom row) are provided to the right of each question.
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North Dakota State University Annual Report Information
Student Rating of Instruction --- Course Level Summary Report
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Please rate: VG = Very Good.....(5) G = Good.....(4) IB = In Between.....(3) P = Poor.....(2) VP = Very Poor.....(1)

Frequencies (top row) and percents (bottom row) are provided to the right of each question.
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Please rate: A B C D E OMIT AREA MEAN S.D. #R

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| Item 9. | 181 | 126 | 52 | 7 | 1 | 5 | | 4.477 | 0.707 | 808 |
| Item 10. | 215 | 130 | 17 | 2 | 3 | 5 | | 4.504 | 0.689 | 367 |
| Item 11. | 223 | 108 | 30 | 4 | 2 | 5 | | 4.488 | 0.739 | 367 |
| Item 12. | 222 | 105 | 31 | 6 | 2 | 4 | | 4.473 | 0.764 | 367 |
| Item 13. | 196 | 115 | 46 | 5 | 5 | 5 | | 4.341 | 0.850 | 367 |
| Item 14. | 222 | 116 | 23 | 4 | 2 | 5 | | 4.530 | 0.662 | 808 |
| Item 15. | 222 | 117 | 23 | 4 | 1 | 5 | | 4.512 | 0.689 | 367 |
| Item 16. | 221 | 125 | 19 | 1 | 0 | 6 | | 4.546 | 0.608 | 366 |
| Item 17. | 211 | 118 | 26 | 7 | 2 | 8 | | 4.453 | 0.757 | 364 |
| Item 18. | 230 | 107 | 25 | 5 | 0 | 5 | | 4.531 | 0.684 | 367 |
| Item 19. | 241 | 111 | 13 | 0 | 1 | 6 | | 4.615 | 0.584 | 366 |
| Item 20. | 233 | 111 | 19 | 2 | 2 | 5 | | 4.556 | 0.671 | 367 |

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**North Dakota State University Annual Report Information**

**Student Rating of Instruction --- Course Level Summary Report**

Report Generated on 29JUN09 Using Data from Fall 2008 & Spring 2009

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**Response Key:**

- VG = Very Good (5)
- G = Good (4)
- P = Poor (3)
- VB = Very Poor (1)
- N = Neutral (2)

**Frequencies (top row) and percents (bottom row) are provided to the right of each question.**

S.D. is the Standard Deviation and N is the Number of Valid Responses.

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**Questions beyond #6 are optional, vary by department, and use the following key:**

- VG = Very Good (5)
- G = Good (4)
- P = Poor (3)
- VB = Very Poor (1)
- N = Neutral (2)

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87
### Department Information

**Level:** 100 & 200 Level Courses  
**Dept:** ANIMAL & RANGE SCIENCE  
# Sheets Scanned: This Level .... 424

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S.D. is the Standard Deviation and #R is the Number of Valid Responses.

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<td>6. your understanding of the course content.</td>
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Please rate: [A=5 B=4 C=3 D=2 E=1]

- A=5 Very Good
- B=4 Good
- C=3 Fair
- D=2 Poor
- E=1 Very Poor

Scores are based on the following key:

- # R is the number of valid responses.
- S.D. is the standard deviation.
- # Sheets Scanned: This level=171
- Dept: ANIMAL & RANGE SCIENCE
- Level: 300 & 400 Level Courses
- College: University

Questions beyond #6 are optional, vary by department, and use the following key:

- A=5 Very Good
- B=4 Good
- C=3 Fair
- D=2 Poor
- E=1 Very Poor

Please rate: [A=5 B=4 C=3 D=2 E=1]

Scores are based on the following key:

- # R is the number of valid responses.
- S.D. is the standard deviation.
North Dakota State University Annual Report Information
Student Rating of Instruction --- Course Level Summary Report
Report Generated on 29JUN09 Using Data from Fall 2008 & Spring 2009

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<th>Response Key:</th>
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Frequencies [top row] and percents [bottom row] are provided to the right of each question. S.D. is the Standard Deviation and #R is the Number of Valid Responses.

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<th>D</th>
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H. Diversity

1. List accomplishments to create a respected and safe environment.

The department has experienced a first. We have a faculty member who has given birth while serving on the faculty. In anticipation of this event, we have engaged in discussion about how we will handle such events in the life of the department. We have an informal policy for family medical leave and agreement that we will pursue the necessary efforts to account for needed work to be accomplished when faculty members are away following the birth of a child. This should be an important step in helping to create a respected and safe working environment which is part of the NDSU Strategic Plan of Diversity.

2. What progress has been made to increase representation of historically underrepresented groups among students, staff, and faculty.

The department faculty originated from three countries, the USA, Poland and Korea. In addition, seven female faculty are included of which six have four or fewer years tenure at NDSU. Females are historically underrepresented in Animal Science. This has changed rapidly in student populations where many departments of Animal Science now have student populations that are majority female. The change has been slower in coming in faculty positions, partially because the pipeline of females with the necessary background for faculty positions has been slow to develop. We are pleased that recent faculty hires have taken large strides to change this situation.

3. What strategical planning has your unit undertaken to address the NDSU Strategic Plan of Diversity.

Planning that addresses the NDSU Strategic Plan of Diversity has taken place in many ways. The focus of such planning is generally for reasons other than diversity planning but diversity ends up being an important part of the issue none-the-less. A good example is the ongoing effort to plan for new and more diverse study options. Part of this effort is to enable us to have programs that appeal to a broader cross-section of prospective programs. We hope that we will have programs that will appeal to students who have primary interests that include such things as bio-medical interests, foods and journalism. Such interests would increase diversity of interests, backgrounds and ways of thinking among our undergraduate population.