A. Department/Unit/College Goals and Priorities for the Past Year

- Hold an annual professional development training for faculty and staff.

Teaching Goals
- Pursue avenues for additional teaching resources (faculty members and budgets) in order to deal with increased enrollment.
- Review and refine the curriculum in the Veterinary Technology program.

Research Goals
- Hire an epigenetics faculty member.
- Seek additional resources for properly staffing the AIM Laboratory.

Extension/Outreach Goals
- Hire a new environmental stewardship specialist.
- Hold the second annual Alumni Reunion.

B. Executive Summary of Accomplishments in Achieving Goals and Priorities for the Past Year

Overall Goal. A professional development workshop was held August 13, 2014, for faculty and staff in the department. An outside speaker was brought in who addressed the role of attitude in relation to workplace morale and happiness. A book was provided for each participant. Our intent is to make this an annual event. The 2015 professional development workshop will be held on August 13, 2015, and will include speakers and time for faculty to address issues related to curriculum and future direction of the department.

Teaching. In 2014, the department had the opportunity to hire an additional instructor to deal with enrollment growth. This person was hired in March 2015 and will be teaching ANSC 114L, ANSC 150, AGRI 189, managing our internship program, and providing coordination for our student newsletters. In addition, the department received some funding to partially fund a teaching assistant for extra sections of our introductory courses.

Research. In 2014, the department redirected a vacant position and developed a job description for a nutritional epigeneticist. This position will have a majority research appointment and will direct a research program which will develop a better understanding of how nutrition and the environment impact the genome. The Advanced Imaging and Microscopy Center was also able to hire a research technician to assist the laboratory director with management of day-to-day laboratory activities.

Extension/Outreach. In 2014, the department took additional steps to strengthen our efforts in the area of livestock stewardship by redirecting a vacant position into the area of environmental stewardship. This new faculty hire joined the department in March 2015 and will focus on helping livestock producers with science-based recommendations related to livestock and
environmental interactions. The department held the second annual Alumni Reunion and Scholarship Fundraiser in Detroit Lakes, Minnesota. The event was well attended and we were able to raise over $10,000 to support our scholarship endowment.

**Other Highlights.** Joel Caton was named associate editor-in-chief of the Journal of Animal Science. Dr. Anna Grazul-Bilska was named an Outstanding Reviewer by Elsevier Publishing. Dr. David Newman was named to the Vance Publishing List of “40 Under 40” for his outstanding efforts to serve the pork industry. Greg Lardy served as past-president for the American Society of Animal Science.

The department held the fifth annual Moos, Ewes, & More event in September. This community open house attracted over 1,500 people. The department also published its second volume of the electronic alumni newsletter which highlights departmental activities and accomplishments. The newsletter is published three times per year. The department hosted visiting scientists from Brazil, China, and Thailand. The visiting scientists worked with our faculty to learn new techniques and enhance their research capabilities. The department also continued to enhance professional growth opportunities for students by hosting a resume workshop and a career networking session with employers prior to the Ag Career Fair.

**Goals for 2015-2016**

**Overall Departmental Goals**
- Engage the Future Directions Committee to examine future needs for the department and use this data for internal and external engagement and funding opportunities.
- Determine whether or not a department advisory board would be beneficial.

**Teaching Goals**
- Work with faculty in the Veterinary Technology program to continue to address items identified in their AVMA Accreditation Report.
- Review the results of curriculum changes in Animal Sciences. It has been five years since our new curriculum was implemented.

**Research Goals**
- Work with the AIM Laboratory director to seek additional laboratory space and support for that facility.
- Continue to seek funding for the construction of a new Meats Research Laboratory.

**Extension/Outreach Goals**
- Seek support for technical support for Extension Specialists in the department.
- Execute a plan to grow the department’s scholarship endowment.

| Peer reviewed publications (published or accepted) | 55 |
| National or international invited presentations | 20 |
| Juried presentations/performances/exhibitions | 0 |
| Research grants and contracts (number that are active) | 55, plus 24 Hatch |
| Cumulative amount (total value of active grants and contracts) | $1,068,475 |
2014 Animal Sciences Department Appendix

I. Listing of Active Grants and Contracts

Active (Continuing) Research Projects (n = 55)


Berg, E.L. Equine assisted activities and therapies education program grant. American Quarter Horse Association.


Caton, J.S. Impacts of maternal nutritional plane and selenium supply on the small intestinal microbiome of the dame and offspring. No external funding.

Caton, J.S. Countering nutritionally induced intrauterine growth restrictions with VEGF gene therapy: Impacts on fetal developmental outcomes. USDA-AFRI.

Caton, J.S. and J. Peine. Effects of maternal nutrition and rumen-protected arginine supplementation of ewe and postnatal lamb performance. SBARE.


Caton, J.S. and K. McLean. Endogenous retroviruses and nutritional management in placental syncytium formation during early gestation. SBARE.

Caton, J.S. and M. Crouse. Maternal nutrition and embryonic survival: nutrient transport to the embryo during day 16 to 50 of gestation. SBARE.


Dahlen, C.R. Evaluating the sustainability of beef cattle breeding systems. USDA SARE.


Grazul-Bilska, A. Impact of nutrition on ovarian function in sheep. State Board of Agricultural Research and Education.

Grazul-Bilska, A. Impact of nutrition on ovarian function in sheep. State Board of Agricultural Research and Education.

Grazul-Bilska, A. and D. Redmer. Role of nitric oxide (NO) system in ovarian function. USDA CSREES/NRI.

Hammer, C. Preliminary study examining the equine digital cushion. No external funding,

Hammer, C. Potential of horses consuming a novel nutritional supplement to test positive on a drug screen. No external funding.

Hammer, C. Palatability of a novel horse supplement. APC, Inc.


Maddock, R., et al. Renewal on the Standing Rock Sioux Reservation. USDA.


Maddock Carlin, K.R. The effects of growth promotant technologies on tenderness variation within a beef retail cut. SBARE.

Maddock Carlin, K.R., E.P. Berg, and Chirasak Phoemchalard. Collagen content of two muscles from Piedmontese x Angus cattle and changes related to field peas in the diet. No funding source.

Maddock Carlin, K.R. and R.J. Maddock. Influence of rate of temperature and pH decline on intramuscular beef tenderness variation in muscles in the round. SBARE.


Newman, D.J. Acquisition of goods and services II. USDA-Agriculture Research Service.


Park, C.S. Lipotropes and mammary growth. National Institute of Health-NCI.


Redmer, D. and A. Grazul-Bilska. Acquisition of equipment for the shared reproductive physiology laboratory spaces. USDA-NIFA.


Smith, D.J., W.L. Shelver, L. Tell, and J.W. Schroeder. Plasma kinetics and tissue residues after label and extra label administration of flunixin meglumine to cull dairy cows with and without endotoxemia. USDA-ARS.


Vonnahme, K. How does a twin pregnancy impact umbilical blood flow in sheep? No external funding.


Vonnahme, K., M.V. Hidalgo, and K. Swanson. Influence of nutrient restriction and realimentation during pregnancy on uterine blood flow in ewes. No external funding


Wagner, S.A. and D. Newman. The effects of ramp exposure during the nursery period on behavior and production in swine. No external funding.

Active (New) Research Projects (n = 24, $1,068,475)


Dahlen, C.R. and C.L. Stoltenow. The NDSU bull test project. Zoetis. 7/1/14-6/30/15. $5,000.

Dyer, N.W. NAHLN member laboratory agreement. National Animal Health Laboratory Network. 5/1/14-4/30/15. $55,000.


Dyer, N.W. Epidemiology and laboratory capacity (West Nile virus surveillance). Centers for Disease Control and Prevention/North Dakota Department of Health. 8/1/14-7/31/15. $34,073.

Hammer. C. Partnering with horses to raise awareness, shift perspective and embrace change. NDSU Diversity Initiatives. $230.

Maddock Carlin, K.R. Effect of implant strategy and supplementation of ractopamine hydrochloride on beef skeletal muscle proteome. Total = $15,916.
  Bridge funding from NDSU Prov000ost. $10,600.
  Bridge funding from NDSU Agricultural Experiment Station $2,650.
  Bridge funding from NDSU Animal Sciences Department, $2,666.

Maddock Carlin, K.R. The effects of growth promotant technologies on tenderness variation within a beef retail cut. SBARE Animal Agriculture grant. 2014. $9,346.


Park, C.S. Canola oil, breast cancer risk: Synergistic effect with methyl nutrients. Total = $100,000.
  Northern Canola Growers Association. 6/1/14-5/31/14. $50,000.
  Agricultural Products Utilization Commission. 8/1/14-7/31/15. $50,000.

Redden, R. Needs assessment for national sheep improvement program. American Lamb Board. 2014. $50,000.


Stokka, G.L., K. Swanson, and J. Gaspers. Evaluation of the impact of vaccination on intakes, the acute phase response, and antibody titers of weaned beef calves. Zoetis. $7,000.


Wagner, S.A. Behavioral methods to evaluate the analgesic effects of non-steroidal anti-inflammatory drug therapy in lame dairy cows. Zoetis. 5/15/14-12/31/15. $61,312.

Other Funding (n = 17; $80,145)


Berg, E.L. Equine assisted growth and learning association training for expansion of existing Therapeutic Horsemanship minor at NDSU. American Quarter Horse Foundation. 4/1/14-8/31/15. $6,970.

Berg, E.L. Moos, Ewes, and More promotion. NDSU Development Foundation Board of Trustees Endowment. $950.


Maddock Carlin, K.R. and W.L. Keller. Renovation of the Muscle Biology/Meat Science Laboratory to make space for newly acquired Typhoon FLA 9500 Imager and accessory equipment. NDSU Forward Lab Renovation Grant. 2014. 5/1/14-4/30/15. $9,346.

Newman, D.J. NDSU BBQ Boot Camp. Total amount = $5,885.
   North Dakota Bankers Association. $3,600.
   North Dakota Beef Commission. $5,000.
   Lamb Promotion Research and Information Board. $500.
   North Dakota Association of Extension Agents. $2,375.
   City of Beulah. $500.
   Cloverdale Meats. $2,000.
   North Dakota Pork Council. $5,600.
   North Dakota Department of Agriculture Turkey Federation. $2,500.
   119th WG MWR. $6,400.
   North Dakota Association of Agriculture Educators. $2,800.
   NDSU Alumni Foundation. $2,610.
   National Pork Board. $10,000.
   Northern Canola Growers Association. $2,000.

Newman, D.J. Research support agreement: Acquisition of goods and services. USDA Agriculture Research Service. 2014. $28,500.

Redden, R. Sponsorship for North Dakota Lamb and Wool Expo. Total = $3,500 in-kind.
   North Dakota Lamb and Wool Producers Association
   North Dakota Corn Growers
   Hendrickx Manufacturing
   CHS Nutrition
   Sydell
   Geitzen Sheep Shearing
   Equity Livestock

Redden, R.R., D. Black, M. Crosswhite, and C. Dahlen. Effect of CIDR and PG 600 on ewe productivity. 7/1/14-6/30/16. $3,000 in-kind.


Redden, R., R. Schmidt, T. Wehrle, and N. Robbins. Sponsorship of Taste of Lamb at Fargo Fiber Arts Festival. American Lamb Board and North Dakota Lamb and Wool Producers
Association. $1,500.


Vonnahme, K.A. Acquisition of a scale. NDSU Development Foundation. 2014. $4,982.


**Hatch Projects (n = 24)**

Berg, E.P. Impacts of stress factors on performance, health, and well-being of farm animals (from W1173). 10/1/11-9/30/16.


Caton, J.S. Improving ruminant use of forages in sustainable production systems for the western U.S. 10/1/12-9/30/14.

Dahlen, C.R. Methods to increase reproductive efficiency in cattle (NC 1038). 10/1/12-9/30/17.


Grazul-Bilska, A.T. Role of the nitric oxide (NO) system in ovarian function. 1/1/12-12/31/14.


Maddock Carlin, K.R. Molecular mechanisms regulating skeletal muscle growth and differentiation. 10/1/10-9/30/15.

Maddock Carlin, K.R. Factors influencing muscle ultrastructure and subsequent impacts on muscle growth and meat quality. 10/1/13-9/30/18.

Maddock, R.J. Enhancing the competitiveness and value of U.S. beef. 10/1/12-9/30/17.

Newman, D.J. Swine production management to enhance animal welfare and value of U.S. pork. 10/1/11-9/30/16.


Redmer, D.A. Regulation of vascular growth and function in reproductive tissues of livestock. 10/1/12-9/30/17.

Redmer, D.A. Acquisition of equipment for the shared reproductive physiology laboratory spaces. 9/1/13-8/31/14.


Schroeder, J.W. Metabolic relationships in supply of nutrients for lactating cows. 2/14/14-9/30/18.


Stokka, G.L. Evaluation of holistic systems/strategies to enhance the health and well-being of livestock. 10/1/14-9/30/19.

Swanson, K.C. Factors Influencing efficiency of nutrient use in ruminants. 10/1/12-9/30/17.

Vonnahme, K.A. Reproductive performance in domestic ruminants. 10/1/12-9/30/16.

Wagner, S.A. Improvement of animal welfare through the assessment and treatment of pain in livestock. 10/1/12-9/30/17.

II. Publications and Presentations

Refereed Journal Articles Published (n = 51, 2 invited)


measures are correlated with feed efficiency in market weight cattle, despite alteration of maternal nutrition during gestation. J. Anim. Sci. 92:3855-3867.


Refereed Journal Articles Accepted or In Press (n = 14, 1 invited)


Papers Published in Proceedings of Meetings (n = 3)


Abstracts Published in Refereed Publications (n = 39)


Abstracts Published in Proceedings of Meetings (n = 47)


Abstracts Accepted or In Press in Refereed Journals (n = 9)


Abstracts Accepted or In Press in Proceedings of Meetings (n = 4)


**National or International Invited Presentations (n = 20)**


Swanson, K.C. Feedlot Nutrition at NDSU. NCCC208 USDA Regional Feedlot Nutrition Committee Meeting. Wooster, OH. May 2014.


**Books (n = 1)**


**Book Chapters (n = 9)**


**Book Chapters in Press (n = 1, 1 invited)**


**Reports to Granting Agencies (n = 7)**


Berg, E.P. Comparison of red meat versus high carbohydrate diet as a means of preventing tissue-specific down-regulation of insulin receptors. Final report submitted to the North Dakota State Board of Agriculture Research and Education.

Berg, E.P. Comparison of red meat versus high carbohydrate diet as a means of preventing tissue-specific down-regulation of insulin receptors; qPCR. Final report submitted to the National Pork Board.

Grazul-Bilska, A.T. Progress report for USDA grant.

Maddock, R. J. and K. Beauchamp. Land, cattle, beef, and people. Update report to USDA at Project Directors Meeting.
Popular Press Articles in 2014 (n = 67)

Bauer, M.L. Every man has a right to his own opinion, but no man has a right to be wrong in his facts: But facts don’t always persuade. ND Stockman. February 2014.


Dahlen, C.R. NDSU leads beef cattle breeding research. 2014 Annual Highlights of NDSU AES and NDSU Extension Service.


Dahlen, C.R. It’s time to body condition score cattle, adjust nutrients for calving and re-breeding goals. ND Stockman. November 2014.


Dahlen, C.R. Increasing plane of nutrition is important heading into breeding season. ND Stockman. April 2014.


Newman, D.J. Biosecurity vital in combating swine virus in North Dakota. NDSU Ag News. February 27, 2014.


Reviewed Extension Publications in 2014 (n = 9)


Hammer, C.J. V-541. Strangles.

Lardy, G. and V. Anderson. AS-1242R. Feeding coproducts of the ethanol industry to beef cattle.

Newman, D. and J. Young. AS-1708. North Dakota swine health recommendations: Exhibitors of all pigs going to exhibits or sales.


Videos (n = 3)


Webinars (n = 0)

None.

Software (n = 1)

Hanna, L.H. Cow Herd Appraisal Performance Software (CHAPS). Assisted with concepts and items that should be included in the upgraded CHAPS program. Provided ideas of how research data could be collected through program.
**Apps (n = 0)**

None.

**III. Awards (State, Regional, National, International (n = 3))**

Bauer, Marc. 2014 NACTA Journal Award – Honorable Mention.

Grazul-Bilska, A.T. Outstanding Reviewer status awarded by Elsevier for reviews completed in 2012-2014 for the Elsevier journals.