2005

Department of Veterinary and Biomedical Sciences: 2005 Annual Report

University of Nebraska-Lincoln
Institute of Agriculture and Natural Resources

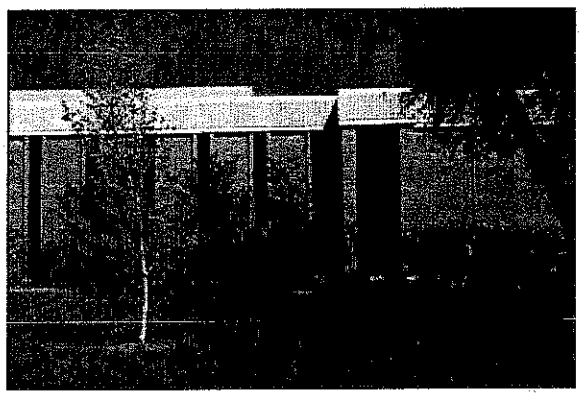
Department of Veterinary and Biomedical Sciences

2005 Annual Report

Facilities

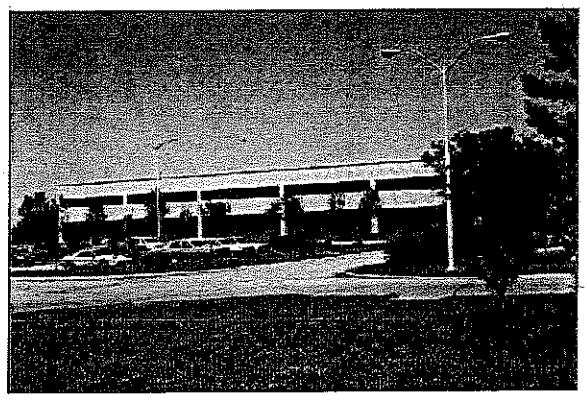
Department of Veterinary and Biomedical Sciences

Veterinary Basic Science
Lincoln, NE

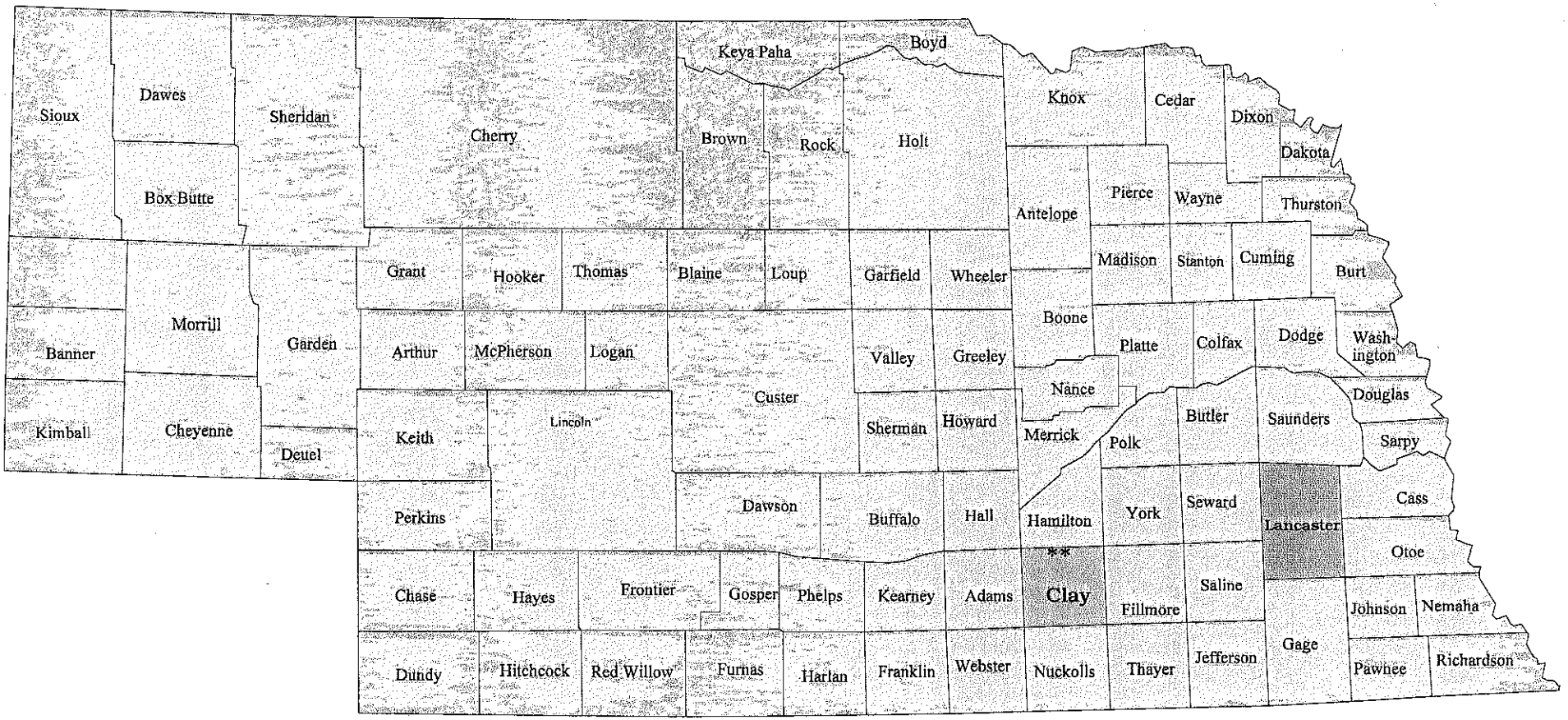


Veterinary Diagnostic Center
Lincoln, NE

Great Plains Veterinary Educational Center
Clay Center, NE



STATE OF NEBRASKA



** Great Plains Veterinary Educational Center, Clay Center, NE

Veterinary Science Complex, (Veterinary Basic Sciences, Veterinary Diagnostic Center, Animal Research Facility, Sewage Sterilization Plant and Animal Holding Facility)

UNL Agricultural Research and Extension Center, Mead, NE (VBMS Beef Cattle Herd)

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DEPARTMENT OF VETERINARY AND BIOMEDCIAL SCIENCES
2005 PERSONNEL

Faculty

Barletta, Raúl G.,[1]* BS, MS, PhD ..... Professor

Brodersen, Bruce W.*, BS, DVM, MS, PhD ..... Research Associate Professor

Carlson, Michael P., BS, MS, PhD ..... Lecturer

Cirillo, Jeffrey D.[2]*, BA, PhD, MS ..... Associate Professor

Das, Subash[1], DVM, MVS, PhD ..... Research Assistant Professor

Doster, Alan R.,* DVM, MS, PhD, ACVP ..... Professor

Duhamel, Gerald E.,* BS, DMV, PhD, ACVP ..... Professor

Ellis, Roger W.,[2] BS, DVM, MS ..... Lecturer

Fernando, M. Rohan, BS, MSc, PhD, MPhil ..... Research Assistant Professor

Griffin, D. Dee,* BS, DVM, MS ..... Professor

Hinkley, Susanne[2]* DVM, MS, PhD ..... Assistant Professor

Jones, Clinton J.,* BA, PhD ..... Professor

Kelling, Clayton L.,* BS, MS, PhD, DVM ..... Professor

Lou, Marjorie F.,* BS, MS, PhD ..... Professor

Moxley, Rodney A.[2],* DVM, PhD ..... Professor and Interim Department Head

Osorio, Fernando A.,* MV, MS, PhD, ACVM ..... Professor

Pattnaik, Asit K.*[1], BS, MS, PhD ..... Professor

Paul, Prem S.*, BVSc, PhD ..... Professor, UN-L, Vice Chancellor for Research

Rogers, Douglas G.[1]* BS, DVM, MS, PhD ..... Professor and Interim Department Head

Rupp, Gary P.,* DVM, MS ..... Professor

Schmitz, John A.,* DVM, PhD, ACVP ..... Professor

Smith, David R.,* BS, DVM, PhD, ACVPM, ABVP ..... Associate Professor

Somerville, Greg A.*, PhD, MS, BS ..... Assistant Professor

Steffen, David J.[1],* BS, DVM, PhD, ABVP ..... Professor

Wohlers, Arden, BS, DVM ..... Extension Assistant Professor

Zhang, Yange[2], BS, MS, PhD ..... Research Assistant Professor

Zhou, Joe Y., BSc, PhD ..... Research Associate Professor

[1] Appointment Began in 2005 **[2] Appointment Ended in 2005** ***Graduate Faculty**

VBMS Researchers, Postdoctoral and Senior Research Associates, 2005

Barletta-Chaćon, Ofelia, ... Postdoctoral Research Associate

Berberov, Emil M.,[2] MSc, PhD ..... Researcher

Jaroni, Divya, BS, MS, PhD ..... Postdoctoral Research Associate

Jiang, Yunquan,[2] BS ..... Researcher

Liu, Shuanghu,[2] BS, MD, PhD ..... Senior Research Associate

Pandey, Amit Kumar[2], BVSc, MSc, PhD ..... Postdoctoral Research Associate

Park, Bonggoo,[2] PhD, BS ..... Postdoctoral Research Associate

Peng, Weiping, BS, MS, PhD ..... Senior Research Associate

Samrakandi, Mustapha M., BS, MS, PhD ..... Researcher

Subbian, Selvakumar,[2] BS, MS, PhD ..... Postdoctoral Research Associate

Topliff, Christina,[1] BS, DVM, MS, PhD ..... Postdoctoral Research Associate

Xing, Kuiyi[1], BS, PhD ..... Senior Research Associate

VBMS Adjunct and Courtesy Faculty, 2005

Campos, Manuel *, DVM, MS, PhD ..... Adjunct Associate Professor
Chenoweth, Peter J.,* BVSc, PhD ..... Adjunct Professor
DeGroff, Terry, DVM ..... Adjunct Assistant Professor
Dewey, Catherine*, DVM, MS, PhD ..... Adjunct Assistant Professor
Donis, Ruben O.,* MV, PhD ..... Adjunct Professor
Fajt, Virginia R., DVM, PhD ..... Adjunct Instructor
Grotelueschen, Dale M.* , DVM, MS ..... Adjunct Professor
Hesse, Richard*, BA, MS, PhD ..... Adjunct Assistant Professor
Hodgson, Clague P., BSc, PhD ..... Adjunct Associate Professor
Hungerford, Laura L.*, BS, DVM, PhH, PhD ..... Adjunct Associate Professor
Hunsaker, Beck D.,* BS, DVM, MS, PhD ..... Adjunct Assistant Professor
Kador, Peter*, BA, PhD ..... Adjunct Professor
Keen, James Edward, BS, BS, DVM, PhD ..... Adjunct Associate Professor
Laegreid, William, BS, MS, DVM, PhD ..... Adjunct Associate Professor
Larson, Robert L., BS, DVM, PhD ..... Adjunct Assistant Professor
Lechtenberg, Kelly F.*, BS, DVM, PhD ..... Adjunct Assistant Professor
Loskutoff, Nadia, BS, MS, PhD ..... Adjunct Assistant Professor
Perino, Louis*, BS, DVM, PhD ..... Adjunct Associate Professor
Petro, Thomas,* BS, MA, PhD ..... Courtesy Professor
Pierce, Vern L., PhD, MS, MS, BS ..... Adjunct Assistant Professor
Rock, Daniel*, BSE, PhD ..... Adjunct Associate Professor
Ross, Gary, BS, DVM ..... Adjunct Assistant Professor
Sanderson, Michael, BS, DVM, MS ..... Adjunct Associate Professor
Sargeant, Janice Merrill , DVM, MSc, PhD ..... Adjunct Assistant Professor
Sherman, Gary B., BS, MS, DVM, PhD ..... Adjunct Courtesy Professor
Solheim, Joyce C., BS, MA, PhD ..... Courtesy Assistant Professor
Spire, Mark F.,* BS, DVM, MS ..... Adjunct Professor
Spitzer, John C., BS, MS, PhD ..... Adjunct Professor
Straw, Barbara E.*, DVM, PhD ..... Adjunct Professor
Wach, Ricky Sue B., BA, DVM, MA ..... Courtesy Instructor
Wittum, Thomas*, BS, MS, PhD ..... Adjunct Assistant Professor
Wood, Charles*, BA, MA, MPhil, PhD ..... Courtesy Professor
Wylie, Dwane*, BA, PhD ..... Courtesy Professor
Zimmerman, Jeffrey J., BA, DVM, MS, PhD ..... Adjunct Associate Professor

Emeriti Faculty

Dickinson, Earl,* BS, DVM, PhD ..... Professor Emeritus
Erickson, E. Denis*, DVM, PhD, ACVM ..... Professor Emeritus
Frey, Merwin,* BS, DVM, MS, PhD ..... Professor Emeritus
Hogg, Alex,* DVM, MS ..... Professor Emeritus
Johnson, Jerre L.,* BS, DVM, PhD ..... Professor Emeritus
Rhodes, Marvin,* BS, MS ..... Professor Emeritus
Rice, Duane, BS, DVM ..... Professor Emeritus
White, R. Gene,* BS, DVM, MS ..... Professor Emeritus

2005 VBMS Faculty and Staff Personnel
By Function and Unit

Department Administration Personnel

- ■Rogers, Douglas G.,[1] BS, DVM, MS, PhD ..... Professor and Interim Department Head
- ■Moxley, Rodney A.[2], DVM, PhD ..... Professor and Interim Department Head
- Albrecht, Roxann R. ..... Accounting Clerk III
- Gellatly, Rene K., BS ..... Administrative Team Manager
- Haahr, Patricia K. ..... Accounting Clerk II
- Johnson, Lilo B. ..... Staff Assistant
- Martinez, Patsy A., AA ..... Staff Secretary III

Animal Care Program

- ■Douglas G. Rogers, BS, DVM, MS, PhD ..... Faculty Supervisor

ARF (Animal Research Facility), Lincoln, Nebraska

- ■Clowser, Blaine, BS ..... ARF Animal Operation's Manager
- Fear, Clarence M.,[2] ..... Agricultural Research Technician I
- Grotrian, Bonita K.,[1] ..... Office/Service On Call Worker
- Lytle, Kandy ..... Research Technician II
- Tucker, Steve ..... Office/Service On Call Worker
- Woolard, Rebecca L.[2] ..... Office/Service On Call Worker

VBMS/ARDC - (Agriculture Research and Development Center) Ithaca, Nebraska

- Bergman, Benjamin ..... Agricultural Research Technician I
- Justin Heldt ..... Office/Service On Call Worker

Pre-Veterinary Advising Center

- ■**Steffen, David J.**, BS, DVM, PhD, ABVP ..... Advisor
- Aerts, Alyse ..... Peer Advisor
- Heidbrink, Nathan[2] ..... Peer Advisor
- Fry, Pamela ..... Senior Peer Advisor
- Painter, Laura ..... Peer Advisor

Cataract Research

- ■Lou, Marjorie, PhD ..... Biomedical Biochemist, Professor
- Chen, Chao-Wei (Kate), BA, MS ..... PhD Student
- Fernando, M. Rohan, BS, MSc, PhD, M.Phil. ..... Research Assistant Professor
- Liyanage, Namal,[2] BA ..... MS Student
- Wang, Yin, BS, MS ..... PhD Student
- Xing, Kuiyi[1], BS, PhD ..... Senior Research Associate

Immunology Research

- ■TBA ..... Immunologist

Microbiology Research

- ■Barletta, Raúl, PhD ..... Bacteriologist, Associate Professor
- Barletta-Chacón, Ofelia, MSc, MD, PhD ..... Postdoctoral Research Associate
- Chahal, Harpreet,[2] BVSc ..... MS Student
- Dogra, Harshdeep[1], BS, MS ..... PhD Student
- Livneh, Ayala,[2] MSc ..... Visiting Scholar
- Liu, Xiaofei, BS ..... PhD Student
- Zinniel, Denise, BS, MS ..... Laboratory Manager

■Cirillo, Jeffrey D.[2], BA, PhD, MS ..... Bacteriologist, Associate Professor
Cirillo, Suat,[2] BS, MS ..... Researcher
Khounlotham, Manirath,[2] BSc, MSc ..... PhD Student
Pandey, Amit Kumar[2], BVSc, MSc, PhD ..... Postdoctoral Research Associate
Park, Bonggoo,[2] PhD, BS ..... Postdoctoral Research Associate
Samrakandi, Mustapha, BSc, MSc, PhD ..... Researcher
Subbian, Selvakumar,[2] BS, MS, PhD ..... Postdoctoral Research Associate

■Duhamel, Gerald, DVM, PhD ..... Pathologist & Microbiologist, Professor
Dassanayake, Rohanna,[2] DVM, MS ..... PhD Student
Gulzar, Ahmed, , BVSc ..... MS Student
Navaratjme. Dhammika, BVSc ..... PhD Student
Risika, Jinadasa, BVSc ..... MS Student
Stryker, Cynthia ..... Research Technician III

■Moxley, Rodney, DVM, PhD ..... Pathologist & Bacteriologist, Professor
Bailey, Doreen, AS, MT (Asst BioSci) ..... Research Technician III
Berberov, Emil,[2] MSc, PhD ..... Researcher
Bretschneider, Gustavo, DVM ..... PhD Student
Erume, Joseph, DVM, MS ..... PhD Student
Fushia, Kristine M.[2] (AnSci) ..... *E. Coli* Laboratory Supervisor
Hansen, Karen, BA ..... Research Technician III

■Somerville, Greg A., PhD, MS, BS ..... Microbiologist, Assistant Professor
Jacobs, Erik[1], BS ..... (Biochemistry Major) PhD Student
Levorson, Erica[1] ..... Undergraduate Student
Lucas, Melissa[1], BS ..... (Biochemistry Major) PhD Student
Zhu, Yefei,[1], MEDI, MSVc ..... PhD Student

Virology Research

■Jones, Clinton, PhD ..... Virologist, Professor
Geiser, Vicki, BS, MS ..... PhD Student
Henderson, Gail, MA ..... Research Technologist I
Jiang, Yunquan,[2] PhD ..... Researcher
Meyer, Florencia, BS MS (SBS) ..... PhD Student
Peng, Weiping, BS, MS, PhD ..... Senior Research Associate
Perez de Bretschneider, Sandra, DVM, MS ..... PhD Student
Saira, Kazima[1], BS, MS ..... PhD Student
Zhang, Yange,[2] BS, MS, PhD ..... Research Assistant Professor

■Kelling, Clayton, DVM, PhD ..... Virologist, Professor
Mori, Yuko, BS ..... MS Student
Topliff, Christina[1], BS, DVM, MS, PhD ..... Postdoctoral Research Associate

■Pattnaik, Asit K., BS, MS, PhD ..... Associate Professor
Ansari, Israrul H., BSc, MSc, PhD ..... Researcher
Das, Subash C.[1], BSVc, MVSc, PhD ..... Research Assistant Professor
Debasis, Nayak, BVSc, MVSc ..... PhD Student
Gil, Zhi Hong ..... Laboratory Assistant II
Liu, Shuanghu,[2] BS, MD, PhD ..... Senior Research Associate
Martinsen, Angela M., MS ..... Lab Manager/Research Technologist

■Osorio, Fernando MV, PhD ..... Virologist, Professor
Aguirre, Sebastian,[2] BSc ..... Visiting Scholar
Brito, Monica R., BS, MS ..... Laboratory Manager
de Lima, Marcelo, DVM, MS ..... Visiting Scholar

Garcia, Esther Alvarez,[2] DVM, MS ..... Visiting Scholar
Hsu, Ching Hsin, BS ..... MS Student
Kwon, Byungjoon, DVM, MS ..... PhD Student
Oliveira, Marilia, DVM ..... MS Student

Research Support Glassware Preparation Laboratory

▪Barletta, Raúl[1], PhD ..... Bacteriologist, Professor
Duhamel, Gerald,[2] DVM, PhD ..... Pathologist & Microbiologist, Professor
Nilson, David ..... Lab Assistant II
Rajagopol, Janaki ..... Lab Assistant II

UNL Core Microscopy Facility – Beadle Center

Zhou, You (Joe), BSc, PhD ..... Director, UNL Core Microscopy Laboratory

Veterinary Epidemiology Research

▪Smith, David, DVM, PhD, ACVPM, ABVP ..... Faculty Supervisor, Extension
Clowser, Sharon, BS ..... Extension Assistant

Extension

Clowser, Sharon, BS ..... Extension Assistant, Lincoln
Griffin, Dee, DVM, MS ..... Feedlot Cattle, GPVEC
Smith, David, DVM, PhD ..... Dairy and Beef Cattle Veterinarian, Lincoln

Nebraska Veterinary Diagnostic Laboratory System - Lincoln, North Platte, Scottsbluff

▪Rogers, Douglas G.,[1] BS, DVM, MS, PhD ..... Interim Executive Director
Moxley, Rodney A.[2], DVM, PhD ..... Interim Executive Director
Steffen, David DVM, PhD ..... Director, VDC Lincoln

Veterinary Diagnostic Center (VDC) Office Personnel

▪Steffen, David, DVM, PhD ..... Director
Ellis, Roxane L., BS ..... Specialist
Henning, Donna J. ..... Clerical Assistant III
Henningson, Jamie, BS, DVM ..... PhD Student
Laws, Lenora L. ..... Clerical Assistant III
Seelmeyer, Mavis C. ..... Staff Secretary III

Bacteriology

▪Hinkley, Susanne[2], DVM, MS, PhD ..... Bacteriologist, Faculty Supervisor
Bauman, Jamie ..... Research Technician III
Combs, Recky S. ..... Research Technician III
Ele, Shirley,[2] BS ..... Research Technologist I
Gehers, Angela ..... Research Technician III
Jaroni, Divya, BS ..... Postdoctoral Research Associate
Kuszak, Jennifer, BS ..... Laboratory Specialist
Lin, Qin ..... Research Technician III
Mosier, Trissa ..... Research Technician III
Olsen, Cassandra J. ..... Research Technologist
Pike, Laura G. ..... Research Technician III
Royal, Deb, AS, BS ..... Laboratory Manager
Widner, Kay S.[2] ..... Research Technician III
Williams, Patrick D. ..... Research Technician III

Glassware Preparation Lab

Heyer, Mary ..... Lab Assistant III

Histology

- ▪Doster, Alan, DVM, PhD ..... Faculty Supervisor
- Braderic, Marijana ..... Histological Technician III
- Claussen, Pat, CDA ..... Research Technician II
- Fields, Rosa M. ..... Histological Technician III
- Johns, LaVonne, HT ..... Histotechnician III
- Olmscheid, Robin, HT ..... Laboratory Supervisor
- Premaratnemenike, Kalyani, BSc ..... Histopathology Technician III

Necropsy

- ▪Doster, Alan, DVM, PhD ..... Pathologist, Faculty Supervisor
- Riggert, Christen, BS, AS ..... Research Technician III

Pathology

- ▪Doster, Alan, DVM, PhD ..... Pathologist
- Brodersen, Bruce, DVM, MS, PhD ..... Pathologist
- Henningson, Jamie, BS, DVM ..... PhD Student
- Rogers, Douglas, DVM, PhD ..... Pathologist
- Nabity, Paul[2] ..... MS Student
- Schmitz, John A., DVM, PhD, ACVP ..... Pathologist
- Steffen, David, DVM, PhD ..... Pathologist

Toxicology

- ▪Carlson, Michael, PhD ..... Diagnostic Toxicologist/Analytical Chemist
- Rajurkar, Sanju, MS ..... Research Technician II

Virology

- ▪Osorio, Fernando, MV, MS, PhD ..... Virologist, Faculty Supervisor
- Braswell, Steve[1], AA, BS ..... Research Technician III
- Dabydeen, Fredrick ..... Laboratory Assistant II
- Frink, Stephaine K. ..... Research Technician III
- Galeota, Judi, BS ..... Lab Manager
- Lin, Qin ..... Research Technician III
- McCoy, Shannen, BS ..... Research Technician III
- Moural, Timothy W., BS ..... Research Technician III
- Russ, Julia A. ..... Research Technician III
- Schulz, Sean[2], BS ..... Research Technician III
- Stamerova-Berberova, Hristina H.[2] ..... Research Technician III
- Wagner, Angela, BS ..... Research Technician III
- Xie, Liping, MD ..... Research Technologist

Quality Assurance Program

- Pedersen, Marci, BS, MA ..... Quality Assurance Manager

Great Plains Veterinary Educational Center (GPVEC) Clay Center, Nebraska

- ▪Rupp, Gary, DVM, MS ..... Director & Professor – Beef Cattle
  - Hermesch, Dennis, BS, DVM ..... MS Student
  - Kramer, Rolland, BS, DVM ..... MS Student
  - Reece, Thomas, BS, DVM ..... MS Student
- Dana, Ramona ..... Custodian II
- Ellis, Roger,[1,2] BS, DVM, MS ..... Lecturer
- George, Debbie ..... Staff Assistant
- Griffin, D. Dee, DVM, MS ..... Professor – Beef Cattle Extension Feedlot Veterinarian
  - Brockway, Willliam,[2] BS, DVM ..... MS Student
- Johnson, Steve E., BA ..... Systems Analyst
- Shuck, Karen K., CVT ..... Veterinary Technician, Agricultural Research Technician II

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES HONORS, AWARDS AND RECOGNITIONS, 2005

University of Nebraska Awards

Graduate Students

Rohana P. Dassanayake received the "Milton E. Mohr Fellowship," from the University of Nebraska-Lincoln, Center for Biotechnology

Rohana P. Dassanayake received "IANR Student Research Travel Funds," from the University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Agricultural Research Division to attend the Conference in Research Workers in Animal Diseases in St. Louis, MO, December 4-6, 2005

Rohana P. Dassanayake and **Florencia Meyer** received the "Maude Hammond Fling Fellowship" from University of Nebraska-Lincoln, Office of Graduate Studies, for their "High Scholastic Performance and Accomplishments" as Student Scholars

Vicki Geiser received the "Ruth L. Kirschstein National Research Service Award," for Pre-doctoral Fellows from the Department of Health & Human Services, National Institutes of Health

Joseph Erume received the "Frank & Marie Wheeler Fellowship," from the University of Nebraska-Lincoln, Office of Graduate Studies

Joseph Erume received the "Shear-Miles Fellowship," from the University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Agricultural Research Division

Yin Wang received the "Othmer Fellowship," from the University of Nebraska-Lincoln, Office of the Graduate Studies

Judy Bowmaster, MS candidate, Distant Education, received the "Holling Family Award" for Teaching Excellence from the University of Nebraska-Lincoln, College of Agriculture Sciences and Natural Resources

Yuko Mori received the "Widaman Trust Distinguished Graduate Assistant Award," for outstanding performance as a graduate student, from the University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Agricultural Research Division

Faculty Awards and Recognitions

Fernando A. Osorio received the "Dermott Coyne Award" in recognition to leadership and exemplary service to International Students, from the University of Nebraska-Lincoln,

Office of the Senior Vice Chancellor for Academic Affairs

David J. Steffen received a "Certificate of Superior Academic Advising Award" from the University of Nebraska-Lincoln, College of Agricultural Sciences Natural Resources at their annual banquet April 17, 2 005

Drs. Bruce W. Brodersen and **Douglas G. Rogers** were nominees for the "Superior Academic Advising Award" from University of Nebraska-Lincoln, College of Agricultural Sciences and Natural Resources

Drs. Asit Pattnaik and **David J. Steffen** were promoted to the rank of Professor

Sabash Das, Center for Virology, was Promotion to the rank Research Assistant Professor

Department of Veterinary and Biomedical Sciences Departmental Awards

Paul Nabity, MS Program, received "Best Seminar Award," from the University of Nebraska-Lincoln, Department of Veterinary and Biomedical Sciences

Vicki Geiser, PhD Program, received "Best Seminar Award," from the University of Nebraska-Lincoln, Department of Veterinary and Biomedical Sciences

Sandra Perez received the "Susan Ann Smith Mills Endowment Award," from University of Nebraska-Lincoln, Department of Veterinary and Biomedical Sciences

National and Regional Awards

Dr. Gary Rupp, Director, Great Plains Veterinary & Educational Center, received the "Beef Award," from the American Association of Bovine Practitioners Conference, Fort Worth, Texas

Dr. David R. Smith, Dairy and Beef Cattle Veterinarian, University of Nebraska-Lincoln, Veterinary and Biomedical Sciences Department, Institute of Agriculture and Natural Resources, received the "Wendell Burgher Beef Industry Award." The award recognizes Dr. Smith's excellent UNL Extension education and research efforts in animal production food safety issues, including epidemiology of *E. coli 0157:H7* and *salmonella* in feedlot cattle. The award was made possible through gifts to the University of Nebraska Foundation by Louis W. Burgher, Fort Calhoun, Nebraska, in memory of his father, Wendell.

University of Nebraska-Lincoln
Department of Veterinary and Biomedical Sciences
2005 Service Awards

5 years	10 Years	25 years
Sharon Clowser	Gail Henderson	Michael P. Carlson
Seetharaman Gopinath	David J. Steffen	
Lanora Laws		

UNDERGRADUATE STUDENTS
2005 DEAN'S LIST

Veterinary Sciences Majors — Spring 2005

Donna Bader	Pamela Fry	Ashley Meyer	Abby Van Hoef
Jordan Bader	Cody Hankins	George Petersen	Daniel Woodbury
Elizabeth Farrow	Malori Marotz	Sara Schuessler	

Veterinary Science Major — Fall 2005

Donna Bader	Lindsey Hofman	Stephanie Schenkelberg
Jordan Bader	Kathryn Kasten	Sara Schuessler
Meredith Cruse	Malori Marotz	Lauren Taylor
Elizabeth Farrow	Abby McCracken	Abby Van Hoef
Pamela Fry	Laura Painter	Daniel Woodbury

Pre Vet

Kelly Kappen	Jennifer Woods

Undergraduate Award
College of Agricultural Sciences and Natural Resources

Rachel Friedrich received the William Charles Yount Educational Veterinary Scholarship from University of Nebraska-Lincoln, College of Agricultural Sciences and Natural Resources

Outstanding Woman in Science Award

Michelle Bader	Nichelle Ferdinand	Laura Painter	Melissa Thompson
Elizabeth Farrow	Jennafer Glaesemann	Holly Samson	Kylie Wiedel
Pamela Fry	Meggan Kroeker	Sara Schuessler	

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
2005-2006 COMMITTEE ASSIGNMENTS

Name	Term	
	Begin	End
Peer Review Committee (3-Yr Appt)		
Gerald Duhamel (Chair/November 05 - October 06)	October, 2002	September, 2008
Clayton Kelling	October, 2003	July, 2006
Gary Rupp	November, 2005	October, 2008
David Steffen	October, 2000	September, 2006
Raúl Barletta	November, 2005	October, 2008
VBMS-IBMS Graduate Committee (3-Yr Appt)		
Gerald Duhamel, Chair	August, 2004	August, 2007
Greg A. Somerville	October, 2005	September, 2008
Raúl Barletta	August, 2004	August, 2007
Clayton Kelling	August, 2004	August, 2007
Rodney Moxley	August, 2004	August, 2007
Lee Johnson (Secretarial Support)	--	Indefinite
Safety Committee		
Raúl Barletta (Chair, VBS)	September, 1999	August, 2002
Robin Olmsheid (VDC)	September, 1998	August, 2004
Kandy Lytle (ARF)	February, 2003	August, 2006
Doreen Bailey (VBS/Technician)	September, 2000	August, 2003
Douglas Rogers (VDC)	September, 1999	August, 2002
Marci Pedersen, Secretarial Support	July, 2005	Indefinite
Veterinary and Biomedical Science Undergraduate Student Research Coordinator		
Gerald Duhamel	November, 2002	Indefinite
Seminar, Chairman		
Douglas G. Rogers	November, 2005	Indefinite
George A. Young Swine Conference Planning Committee		
Bruce Brodersen (Chair)	January, 2005	December, 2005
Tom Buelt	January, 2005	December, 2005
Larry Germer	January, 2005	December, 2005
Phil Hardenburger	January, 2005	December, 2005
Mike Brumm	January, 2005	December, 2005
Jim Unwin	January, 2005	December, 2005
Jeff Husa	January, 2005	December, 2005
Ron Brodersen	January, 2005	December, 2005
David Hansen	January, 2005	December, 2005
Sharon Clowser, Conference Coordinator	January, 2005	December, 2005

Name	Term	
	Begin	End
Department Curriculum Committee		
David Steffen (Chair, August 2005)	August, 2003	Indefinite
Bruce Brodersen	October, 2004	Indefinite
Michael Carlson	August, 2005	Indefinite
Clayton Kelling	September, 2000	Indefinite
Jack Schmitz (2-yr term)	August, 2005	August, 2007
Nebraska Veterinary Student Admission Committee (2-yr term)		
Gary Rupp (NU/GPVEC)	2005	2007
Bruce Brodersen (UNL/VDC)	2005	2007
Rosemarie Nold (UNL/AnSci)	2005	2007
Randall Schawang (NVMA Rep)	2005	2007
Ron Wallman (Veterinarian/Seward Animal Hospital)	2005	2007
Don Draper (Assoc. Dean/ISU)	2005	2007
Monica Howard (Dir Student Prog/ISU)	2005	2007
Mavis Seelmeyer (UNL Secretarial Coordinator)	–	Indefinite
Kathy Kuehl (Coordinator of Admissions/ISU)	–	Indefinite
Departmental Computer Support Designee and Liaison to IANR Computing		
Roxane Ellis	1990	Indefinite
CASNR Curriculum Committee (2-yr term) **(Veterinary and Biomedical Sciences; Biochemistry; and Food Science and Technology Departments)**		
John A. Schmitz	July, 2005	June, 2007
CASNR Faculty Advisory Council (2-yr term)		
Raúl G. Barletta	July, 2005	June, 2007
Pre-Veterinary Club Advisor		
Douglas Rogers, Advisor	May, 2004	Indefinite
David Smith, Co-Advisor	May, 2004	Indefinite
ARD Advisory Council (3-yr term) **(District 5 – Department of Statistics, Entomology and Veterinary and Biomedical Sciences)**		
Lance Meinke (Statistics)	May 2005	April 2008
Institutional Animal Care and Use Committee		
Gerald Duhamel Fernando A. Osorio, Alternate	January, 2000	December, 2005
Institutional Biosafety Committee		
Rodney A. Moxley	January, 2006	December, 2008
ARDC Oversight Committee		
John A. Schmitz	1998	Indefinite

Name	Term	
	Begin	End
VBMS Husker Harvest Days Committee		
Michael Carlson, Chair	June 2002	Indefinite
Clayton Kelling	June 2002	Indefinite
D. Dee Griffin	June 2002	Indefinite
David Steffen	June 2002	Indefinite
UNL Radiation Safety Committee		
Raúl Barletta	February, 2000	Indefinite
VBMS Representative to UNL Library		
Raúl Barletta	2000	Indefinite
VBMS Website Oversight Committee		
Fernando Osorio	February, 2003	Indefinite
Raúl Barletta	February, 2003	Indefinite
Bruce Brodersen	February, 2003	Indefinite
David Smith	February, 2003	Indefinite
Rodney Moxley	February, 2003	Indefinite
Roxane Ellis, Technical Support	February, 2003	Indefinite

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES

FACULTY PROFILES

Raúl G. Barletta, BS, MS, PhD
Professor

Bbacterial Pathogenesis/Drug Resistance/
Mycobacteria/Tuberculosis
Appointment: 0.88 Rsch; 0.1 Tchg; 0.02 Citizenship

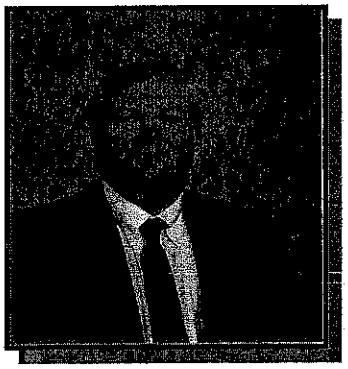
The main focus of my laboratory is the study of bacterial pathogens including *Mycobacterium tuberculosis, Mycobacterium avium* subsp. *paratuberculosis* and related pathogens. In this area, the major long-term goals in my laboratory are: 1) to understand virulence and drug- resistance mechanisms in pathogenic mycobacteria, and 2) to develop molecular tools to diagnose and control mycobacterioses.

Drug resistance studies in mycobacteria have focused on the molecular targets of peptidoglycan synthesis inhibitors. We have identified the molecular targets for D-cycloserine. One of these targets is the enzyme D-alanine racemase, involved in the initial steps of peptidoglycan biosynthesis. Furthermore, we have shown that overproduction of D-alanine racemase in mycobacteria underlies the D-cycloserine resistance phenotype of resistant mutant strains. The specific molecular mechanism responsible for the overproduction of this enzyme was shown to be a promoter-up mutation in the control region of the D- alanine racemase gene. We have also studied related enzymes involved in D-alanine metabolism including L-alanine dehydrogenase and D-alanine ligase. We plan to study the essentiality of these genes in the context of drug design and vaccine development in *M. tuberculosis.*

M. paratuberculosis is the causative agent of Johne's disease, a wasting chronic enteritis affecting all ruminants.. We have developed a genetic system for *M. paratuberculosis* that includes phage infection, plasmid transformation, and transposon mutagenesis. We have identified several attenuated strains from a mutant bank. In collaborative studies, we are testing these mutants in animal models including mice and baby goats. In addition, we have identified and characterized *M. paratuberculosis* secreted and cellular immunogenic proteins. From these molecular studies, a practical application test to measure the susceptibility of *M. paratuberculosis* to antimicrobial agents was developed. These steps are essential prerequisites for the understanding of pathogenesis, and the development of anti microbial therapies and new and more effective vaccines compatible with diagnostics.

My teaching responsibilities include serving as co-instructor for the courses VBMS 951 Advanced Molecular Infectious Diseases and VBMS 424/824 Basic Molecular Infectious Diseases. I advised seven MS and three PhD graduate students who have completed their degrees. I served as co-advisor for 2 MS graduate students who completed their degrees.

Bruce W. Brodersen, DVM, MS, PhD
Research Associate Professor



Pathologist, Veterinary Diagnostic Center
Appointment: 1.00 Service

My position was created out of a need for more pathologists at the Veterinary Diagnostic Center. The increased need was a result of continual increase in the numbers of case submission. Existing faculty at the Diagnostic Center were not able to meet other commitments as a result of the elevated case load. Funding for my position comes entirely from revenues generated by submission fees received at the Diagnostic Center.

My efforts are directed at coordination of appropriate testing of samples submitted to the Diagnostic Center, assimilating test results for determining a diagnosis, and generating a suitable report to the submitting veterinarian or owner. The range of species that samples originate from is wide and consists mainly of food animals and companion animals with avian species as well as wild and or exotic and aquatic species. I also supervise the contract with the USDA for testing of samples for scrapie in sheep and chronic wasting disease in deer.

I have no formal research FTE, but I am conducting projects which are directed at investigating diseases of cattle. Currently my projects concentrate mainly on bovine viral diarrhea virus (BVDV). One of these studies includes detection of cattle persistently infected with BVDV. I am collaborating with researchers at Auburn University, investigating the role of BVDV as a reproductive disease in cattle.

Michael P. Carlson, MS, PhD

Diagnostic Toxicologist/Analytical Chemist

Veterinary Diagnostic Center
Appointment: 85% Diagnostic, 15% Teaching

I serve as a diagnostic toxicologist for the VDC. I review cases submitted for toxicology services, obtain case histories as needed, interpret diagnostic toxicology results, write final toxicology reports for diagnostic cases and report results to case submittors or VDC diagnosticians. I also consult with veterinarians, clients and university faculty and staff about toxicology and analytical services.

I also serve as an analytical chemist for the VDC Toxicology Laboratory. I manage the operation of that laboratory; select and validate methods for analytical services; supervise, train and manage the staff of that laboratory; and assist with performance of analytical services as required.

I teach VBMS 410 – Introduction to Pharmacology and Toxicology, a 4-credit hour, integrated studies course required for Veterinary Science undergraduate majors. The course is intended to introduce students to basic principles of drug action and toxic effects of chemical substances. The course also emphasizes written and oral communication skills. Students are required to write a position paper on a controversial pharmacology or toxicology topic and present their position orally to the class. It is offered annually each fall semester.

My research interest is nitrate toxicosis in cattle, especially chronic nitrate exposure related to abortions.

I also am interested in the application and implementation of international standards for laboratory certification to veterinary diagnostic laboratories.

Jeffrey D. Cirillo, BA, PhD, MS
Associate Professor

Infectious Diseases
Appointment: 0.85 FTE Rsch; 0.15 FTE Tchg

Our laboratory is interested in the pathogenesis of bacterial lung infections, which currently cause disease in more than one-third of the world's population; such as, tuberculosis, tularemia and Legionnaires' disease. We are examining the virulence mechanisms of bacteria using cellular, molecular and genetic techniques. Our primary research goal is to obtain a better understanding of the roles of the pathogen and host in disease so that we may develop novel methods for prevention and treatment. These studies should contribute to our understanding of host-pathogen interactions at the molecular and cellular level. In our current studies we have identified several bacterial genes that are required by these organisms to cause disease in animals and humans. Through the use of genomics, proteomics and functional analysis of these genes and mutant bacterial strains, we have better defined how these organisms invade eukaryotic cells and replicate within them. These mechanisms of invasion are critical to the ability of these organisms to survive both during infections and in environmental reservoirs. Infectious diseases involve both the host and pathogen during interactions that result in pathogenesis. For this reason, we also examine mechanisms of host defense, immune evasion, signal transduction, phagocytosis and intracellular trafficking. The primary cell types involved in virulence of respiratory pathogens are human and murine macrophages, but environmental protozoa also play a role and have many similarities to mammalian phagocytic cells. Through examination of interactions by bacterial pathogens with both mammalian and environmental phagocytic cells we have identified potential receptors, signal transduction pathways, cytoskeletal components and intracellular compartments that are involved in the ability of these organisms to cause disease. This two-pronged approach to understanding infectious disease has allowed us to develop relatively comprehensive models for the mechanisms of invasion and pathogenesis during infections in humans and animals. We expect that the continued application of this approach should yield great insight into infectious diseases in general, in addition to that of respiratory pathogens, some of the most important infections in both animals and humans. My main teaching responsibilities include the continuous updating and improvement of two advanced courses in microbial pathogenesis to support the current Departmental curriculum and Ph.D. program. It is expected that these courses will attract a wide audience of graduate and undergraduate students from both UNL and UNMC.

Subash Das, BSVc, MVSc, PhD
Research Assistant Professor

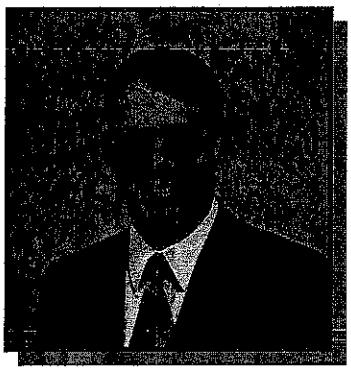
Veterinary Molecular Virologist
Center for Virology and Department of Veterinary and Biomedical Sciences
Appointment: 1.00 FTE Research

My research includes the studies on viral gene expression and vaccine design using RNA viruses. The two viruses I am studying are vesicular stomatitis virus (VSV), a non-segmented negative-strand RNA virus and porcine reproductive and respiratory syndrome virus (PRRSV), a non-segmented positive-strand RNA virus. Due to its simple genome organization VSV has served as an attractive model to study the gene expression in negative-stranded RNA viruses. Understanding the mechanism of gene expression and its regulation is essential to identifying unique virus-specific targets for therapeutic interven-tion in controlling infection. More specifically I am looking at the role of VSV phosphoprotein P in viral transcription, replication and assembly of infectious virus particles. Phosphoprotein of VSV is a multifunctional protein which is an essential subunit of viral polymerase. Using reverse genetics I have demonstrated that phosphorylation at specific residues within the P protein of VSV regulates the activities of the viral RNA-dependent RNA polymerase in transcription and replication and plays a major role in the life cycle of VSV. Using transposon-insertion and deletion mutagenesis we recently found out that the hypervariable hinge region of VSV P protein plays an important role in viral RNA synthesis and assembly of infectious particles. At present we are mapping out the individual amino acids in the hypervariable region of P that is required for virus assembly. Currently efforts are being made to establish a yeast-two-hybrid system to identify the cellular /viral factors involved in the assembly of VSV. We are further planning to investigate the role of nucleotide sequences within the viral genome that control encapsidation, transcription and replication processes.

We have made use of our recent finding that the hypervariable region of VSV P protein can tolerate insertion of 19 amino acids with minimal effect on P protein activity. This has led us to produce a fluorescently labeled VSV with the eGFP inserted at the hypervariable region of P protein. Using this green virus we are investigating the transport of viral nucleocapsids by time lapse microscopy. This has allowed us to track the movement of individual nucleocapsids in infected cells. We have demonstrated that microtubules play an important role in the transport of VSV nucleocapsids from the site of synthesis to the site of assembly and mitochondria may play a role in this process. Several leads in this direction include single-particle tracking of viral nucleocapsids, multicolor live-cell imaging of ribonucleoprotein complexes and identification of microtubule motors involved in the transport.

Another aspect of my work has been the development of viral vaccines by genetic manipulations. At present I am using VSV as a vector to express porcine respiratory and reproductive syndrome virus (PRRSV) glycoproteins to study the immunogenicity of these proteins in animals. Recombinant VSVs expressing PRRSV GP5 and M proteins have been recovered by reverse genetics. Using these recombinant viruses we further plan to study the mechanism of entry and tissue tropism in PRRSV infection. Animal experiments are also being carried out for testing these recombinant viruses for generation of humoral and cell-mediated immune responses against PRRSV and to explore the possibility of using them as vaccines for the prevention of PPRSV infection.

Alan R. Doster, DVM, MS, PhD, ACVP
Professor



Pathologist
Veterinary Diagnostic Center
Appointment: 100% Diagnostic Service

I serve as a Diagnostic Pathologist in the VDC and rotate necropsy duty on a regular basis with other pathologists. We are responsible for the gross examination of various species, histological examination of tissues from necropsies and surgical biopsies; requesting and interpretating results from the bacteriological, serological, virological, toxicological tests which are part of the laboratory work-up; and establishing a diagnosis or rendering an opinion regarding each case. I spend a considerable amount of time on the telephone consulting with veterinarians and livestock owners regarding clinical histories, case submissions, and results of diagnostic testing. I have served as an expert witness many times for legal proceedings or insurance inquiries, the largest being in excess of $20 million. I have acted as a consultant for United States Department of Agriculture regarding foreign veterinary diagnostic laboratory capabilities.

I have no formal teaching FTE, but have served as the faculty coordinator for VBMS 901 (Diagnostic Techniques) and have taught several advanced pathology courses for pathology residents and graduate students. In addition, I have served as major advisor for master's and doctoral students and am a member of several graduate supervisory committees in the Department.

My research interests consist of infectious diseases of cattle and swine. I have been active in pursuing emerging disease syndromes initially seen in the VDC such as porcine reproductive and respiratory syndrome virus (PRRSV) and porcine circovirus infection. The PRRSV project led to the development of a commercially available PRRSV vaccine. I and the other pathologists serve primarily as consultants in a team-oriented approach to research problems where each member of the team contributes his area of expertise to the project. Other faculty in the Department who have major research appointments act as project leaders and request our assistance as necessary.

Gerald E. Duhamel, DMV, PhD, ACVP
Professor

Molecular Microbial Pathogenesis
Appointments: .80 FTE Rsch; .10 Tchg; .10 Serv

My long-range goal is to define basic mechanisms of host-parasite interactions, and their relationship to susceptibility or resistance against disease, particularly within the framework of enteric diseases caused by bacteria and viruses. Presently, I am engaged in basic and applied biomedical research aimed at characterizing molecular mechanisms of microbial pathogenesis and host defense with practical applications to diagnosis and control of enteric diseases of animals and human beings. Specifically, I am investigating the biology of polymicrobial interactions in inflammatory bowel diseases caused by *Brachyspira pilosicoli*, a newly discovered pathogenic intestinal spirochete, enterohepatic *Helicobacter* and *Campylobacter* species of human and animals, and *Lawsonia intracellularis*, an obligate intracellular bacterium that causes proliferative enteropathy in non-human primates and animals.

Also, I am investigating the role of heterotypic immunity in protection against intestinal disease caused by group A rotaviruses, a major cause of diarrheal disease in human infants and animals. Current research addresses bacterial virulence factors and model development of intestinal injury and repair, phenotypic and genotypic bases of microbial pathogenesis, development of molecular methods for diagnosis of enteric diseases and control using subunit and recombinant vaccines.

Roger W. Ellis, BS, DVM, MS

Beef Cattle Clinical Veterinarian/Instructor Lecturer

Great Plains Veterinary Educational Center
Clay Center, NE
Appointment: .25 FTE Rsch; .50 FTE Tchng; .25 FTE Scholarly Srv

The University of Nebraska, Great Plains Veterinary Educational Center serves as an educational resource for students in professional veterinary degree programs at Kansas State University and other colleges of veterinary medicine throughout the United States, and occasionally international institutions. Veterinary students during their fourth year elective clinical rotations are offered the opportunity to participate in a multi-faceted approach to food animal medicine, surgery and production management. Within a cooperative program with the U.S. Meat Animal Research Center, beef cattle and sheep production systems are utilized to offer experiences and clinical skill development to further train students in reproduction, nutrition, economics, health and disease, production management and clinical practicum situations. Although the contact with the livestock resources at U.S. MARC is limited, the research center staff veterinarian has been cooperative in student programs.

In addition, the first-year veterinary students from Kansas State University are offered a one-week introductory exposure to beef, dairy, swine, and sheep production systems and instructed in general clinical skills. Discussions relating and linked with food animal production, such as food safety and quality assurance, animal welfare and environmental issues, producer perspectives on global marketing, and other issues are openly provided. Also, students from UNL in the pre-veterinary club come to GPVEC on a one-day visit to tour the facilities and learn of the opportunities provided.

Continuing education programs for graduate veterinarians and allied specialists are provided in areas such as beef production management, computer record keeping and information systems, source verification and quality assurance, animal identification programs, and many other diverse areas. Extension services to veterinarians, producers, and allied industries are consistently requested and provided, in the form of meetings, conferences, and telecommunications.

Although limited due to staff and time commitments, applied research and studies continue to be explored in the multitude of beef production health and management areas encompassed in the teaching and extension programs.

The future at GPVEC should be exciting with new ventures in the veterinary education program between UNL and cooperative universities with colleges of veterinary medicine. A rekindling of the cooperative efforts and studies between GPVEC and the US MARC are necessary to bring a united effort and support of student programs. Expanded efforts in all aspects of the beef industry and veterinary profession can be provided with additional resources to develop education, research, and extension programs. Most importantly, the veterinary students need this resource for the development of applied clinical skills and practical knowledge. This will remain the priority.

M. Rohan Fernando, BS, MS, MPhil, PhD
Research Assistant Professor

Biochemist
Appointment: 1.00 FTE Rsch

Cataract is the major cause of blindness around the world. Age related cataract or senile cataract is the most common type of cataract. The normally transparent lens of the eye becomes cloudy in cataract. Oxidative stress which is induced by reactive oxygen species (ROS) has long been implicated in senile cataract formation. ROS molecules are generated in the lens either endogenously by enzyme systems or exogenously from the environment. ROS molecules produced through these processes in the lens are neutralized by antioxidants and ROS neutralizing enzyme systems in the lens. Even in the presence of these powerful antioxidants and ROS neutralizing enzyme systems, some ROS molecules get through these defense systems and oxidatively damage cellular molecules such as proteins, lipids and nucleic acids. Oxidation of lens proteins leads to lens opacification and cataract formation. Hence lens is also equipped with enzyme systems that can repair such oxidatively damaged proteins and other molecules. I have focused my research on the characterization of the repair systems in the lens.

1. Functions of thioltransferase-1

Thioltransferase-1 is a thiol/disulfide exchange enzyme. It is located in cytosol and has dethiolation activity in the lens. It can repair oxidatively modified lens proteins using its dethiolation activity. In addition to that we have shown that thioltrasferase-1 has ascorbic acid recycling ability. Human lens contains 2-3 times higher concentration of ascorbic acid as compared to other human tissues. Ascorbic acid functions as an antioxidant and its oxidation product dehydroascorbic acid is highly toxic and has been implicated in human cataract formation. Hence lens must have a mechanism to regenerate ascorbic acid. We have shown that thioltransferase is responsible for ascorbic acid recycling in human lens epithelial cells. We have also investigated the induction of thioltransferase-1, thioredoxin and thioredoxin reductase in pig lens under oxidative stress and found that all three enzymes are induced under the given oxidative stress conditions in an attempt to rescue the lens from the oxidative insult so that the clarity of the lens would not be affected by the give stress.

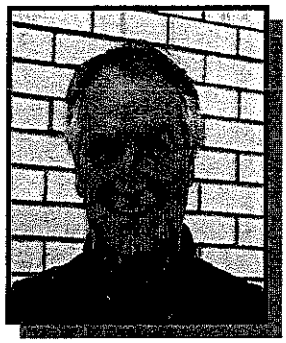
2. Thioltransferase-1 knockout mice

Primary cultures of mouse lens epithelial cells obtained from wild type mouse and thioltransferase-1 knockout mouse are used to compare the sensitivity of the these two cell types to oxidant stress. We are comparing the oxidative damage caused by oxidants in these two cell types using parameters such as marker enzyme activities, glutathione level, cell viability and cell proliferation.

3. Functions of thioltransferase-2

Thioltransferase-2 is the nuclear and mitochondrial isoform of thioltransferase-1. We are investigating the functions of this enzyme in nucleus and mitochondria. Thioltransferase-2 has dehydroascorbate reductase activity, ascorbate free radical reductase activity as well as peroxidase activity. Investigations are under way to elucidate how these functions of this enzyme are important to maintain the integrity of mitochondria and nucleus.

Dicky Dee Griffin, BS, DVM, MS
Professor



Pathologist and Nutrition
Great Plains Veterinary and Educational Center
Clay Center, NE
Appointment: .50 FTE Tchng, .30 FTE Ext;
.20 FTE Service

I am responsible for creating and coordinating veterinary medical education opportunities in feedyards. Through my extension appointment, I am responsible for conducting applied field research that relates to feedlot production management and beef safety. I am also responsible for disseminating production management information to the beef feedlot industry. Through my service commitment I provide a substantial portion of the veterinary medical service to the MARC feedlot. I also act as a consulting veterinarian to Nebraska feedlot veterinarians and other feedlot specialists. Through these contacts, I am able to provide unique educational opportunities to fourth-year veterinary students, veterinary technician students and animal science students.

The crux of my research involves management and production with an emphasis on creating or perfecting techniques that can be of direct benefit to the feedlot industry. I have a passionate interest in beef quality assurance (BQA) and a portion of my research focuses on developing and evaluating pre-harvest techniques that will help guarantee the wholesomeness of the beef supply in the United States. Developing and disseminating pre-harvest HACCP techniques for use in beef feedlots has become a major effort. I recognize the economic need for the beef cattle industry to present consumers with a consistently high quality product. I communicate this information to feedlot veterinarians, feedlot producers and potential consumers through my extension. This involves poster displays at trade shows, invited presentations and through GPVEC's Internet BQA home page. I always include BQA as a part of the focus of my consulting work. Food safety, including pre-harvest HACCP, residue avoidance and minimizing injection site blemishes is always a part of the feedlot teaching curricula at GPVEC.

Inter-departmental or Inter-institutional Cooperative Activities

Cooperator	Cooperative Activity
KSU, Other Colleges of Veterinary Medicine	Electives
Industry representatives and Academicians	Continuing Education Seminars
KSU	Fundamentals of Food Animal Practice
(1st yr Students)	
Joe Bek (NCTA)	Feedlot Technical Elective
Joe Bek (NCTA)	Feedlot Employee Safety Training Workshop
T.J. Klopfenstein, E. Erickson (UNL AnSci Dept)	Undergraduate Feedlot Health
T.J. DeGroff (Practitioner, Burwell, NE)	Training Students
MARC Scientists	Research Projects
Assigned UNL Faculty	ExpoVision and High School Careers Workshop
Assigned UNL Faculty	UNL Youth Leadership Workshop

Susanne Hinkley, DVM, MS, PhD
Assistant Professor

Diagnostic Microbiologist
Veterinary Diagnostic Center
Appointment: .50 FTE Diag Srv; 50% Rsch

Diagnostic Service

Our AAVLD-accredited diagnostic bacteriology laboratory offers full service bacterial, mycological, and parasitological diagnostics. In addition, we have expanded our molecular diagnostic capabilities such that we now offer PCR and RFLP assays for detection, speciation and virulence typing of several bacterial pathogens. As a certified laboratory, we conduct the culture and serology testing for the state's Johne's program. Our in-house developed mycoplasma culture test has been implemented and is widely used by clientele. While offering these services, we are constantly striving to implement new tests both in diagnostic bacteriology and molecular diagnostics.

The laboratory is currently involved in collaborative research with industry, and also has research projects planned to optimize the methodology in DNA extraction for PCR, and to utilize our mycoplasma culture and PCR assay in a field study. Another area of interest is 'infectious bovine keratokonjunctivitis', a disease of cattle caused by *Moraxella* species. The work of a Master's project is focusing on the characterization of virulence factors (in particular a putative RTX exotoxin) of *Moraxella* (subgenus *Moraxella*) *bovis* and *Moraxella* (subgenus *Branhamella*) *ovis*.

Research

We are involved in a large collaborative project with the goal of developing, validating and implementing methods for detection and control of *E. coli* and *Salmonella* in feedlots. The data obtained so far indicate that the novel methodology of testing on the pen level may provide a sensitive, reliable and practical means of identifying pens of cattle shedding *E. coli* and/or *Salmonella*. In addition, the developed methodology may aid in identifying potential points of intervention within a pen of cattle. Currently, we are in the process of validating these pen testing strategies in commercial feedlots. In our research feedlot, we have conducted a study to test the usefulness of an anti-*E. coli* O157:H7 vaccine and a direct fed microbial, both individually and together, in the reduction of the fecal shedding of O157:H7. The preliminary results are very encouraging.

We are also involved in the development and preliminary validation of a field test to test live animals for the presence of antimicrobial residues before they go to slaughter.

Clinton J. Jones, BA, PhD
Professor

Molecular Virologist
Appointment: 0.90 Rsch, Tchg. 0.10

Statement of Current Research Activities

1. a -Herpesvirus latency

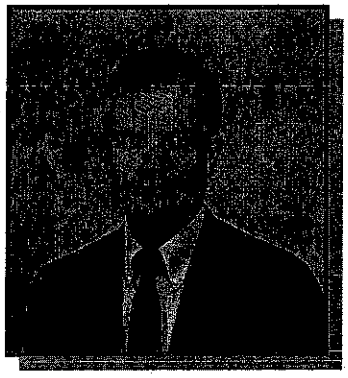
Latency of a-herpesviruses is the focus of research in my laboratory. Bovine Herpes Virus 1 (BHV-1) and Herpes Simplex Virus 1 (HSV-1) are being used to study virus host interactions. BHV-1 is a significant viral pathogen of cattle that can induce respiratory disease, abortion, or occasionally encephalitis. BHV-1 is also a causative agent of "Shipping Fever" or Bovine Respiratory Complex. As a consequence of the pathogenic potential of BHV-1, the cattle industry suffers more than $500,000,000/year in losses. HSV-1 causes a variety of clinical symptoms, is the leading cause of corneal blindness due to an infectious agent, and appears to be a cofactor in Alzheimer's disease. Approximately 99% of all human beings are infected with HSV-1. a-Herpesviruses infect epithelial cells of the upper respiratory tract or the genital tract. Extensive viral gene expression occurs, virus is shed, and clinical symptoms are apparent. Virus enters the peripheral nervous system, trigeminal ganglia or sacral ganglia, where it establishes a latent infection in neurons. Viral DNA can persist in a latent state for the lifetime of the infected host or periodically reactivate. Only one small region of the BHV-1 genome is transcriptionally active in latently infected neurons, the latency related (LR) gene. HSV has a similar gene; the latency associated transcript (LAT). A latent infection can be divided into 3 distinct stages: 1) establishment 2) maintenance and 3) reactivation of latent virus. Reactivation can cause recurrent disease and regardless of the clinical outcome promotes virus transmission. Thus, latency is crucial for pathogenesis and is required for virus transmission.

LR gene products and LAT inhibit apoptosis (programmed cell death) in transiently transfect cells, and in trigeminal ganglia (TG) of infected calves or rabbits respectively. Based on these studies, we hypothesize that LR gene products and LAT promote survival of infected neurons. Future studies will identify the mechanism by which LR gene products and LAT inhibit apoptosis.

2. Regulation of productive infection by bICP0

Bovine herpesvirus 1 (BHV-1) is an important causative agent of "Shipping Fever", an upper respiratory tract disorder that costs the US cattle industry more than $500 million/year. Acute infection by BHV-1 results in conjunctivitis, pneumonia, genital disorders, abortions, and occasionally encephalitis. As discussed above, BHV-1 establishes latency in sensory neurons located in trigeminal ganglia, and also germinal centers within the tonsil. Periodically BHV-1 reactivates from latency, which is crucial for virus transmission in the field. In sharp contrast to latency in which viral gene expression is severely restricted, 75-80 viral genes are expressed during productive infection and reactivation from latency. The bICP0 protein activates expression of all viral genes, and thus stimulates acute infection and reactivation from latency. Our recent studies identified four separate domains in bICP0 that are necessary for activating transcription: 1) the zinc RING finger located between amino acids 13-51, 2) a large domain spanning amino acids 78-265, 3) sequences at or near amino acid 457, and 4) a nuclear localization signal located at the C-terminus. bICP0 also interacts with chromatin remodeling enzymes; histone deacetylase 1 (HDACI) (116) and p300, a histone acetyltransferase (HAT). Functional studies demonstrated that bICP0 inhibits interferon (IFN)-induced transcription, and cooperates with p300 to activate viral transcription. Finally, a bICP0 null mutant was constructed that does not efficiently replicate or kill bovine cells, but this mutant strongly induces the IFN response. Our long-term goals are to delineate the mechanisms by which bICP0 stimulates viral gene expression, productive infection, and reactivation from latency.

Clayton L. Kelling, BS, MS, PhD, DVM
Professor



Microbiologist/Virologist
Appointment: .85 FTE Research;
.15 FTE Teaching

Our research is focused on pathogenesis of bovine respiratory syncytial virus (BRSV) and bovine viral diarrhea virus (BVDV) infections in cattle. Immunity to BRSV infection is incomplete and reinfections occur. Protective host immune responses to vaccines or natural infections may be compromised by mutation of the surface glycoproteins. We are examining the roles of the BRSV surface attachment (G) and fusion (F) glycoproteins in pathogenesis and immunity. Genetic and antigenic heterogeneity, and structure of the BRSV G and F glycoprotein are being studied to determine the influence of those variables on survival of the virus in the host and on development of protective immunity in the host. Our studies involve use of recombinant BRSV glycoproteins expressed in insect cells using the baculovirus vector and developing of a cDNA BRSV F protein vaccine.

The overall goal of our BVDV research is to study the mechanisms involved in the pathogenesis of acute genotype 2 BVDV infections by studying virulence. We are examining the 5' untranslated region (5'UTR) of BVDV isolates for conserved nucleotide base substitutions in the internal ribosomal entry site (IRES) which are biologically significant. Translation studies using cDNA plasmid constructs of the 5' UTR of isolates from a panel of genotype 2 BVDV isolates are being used to study relationships between translational efficiency and virulence of individual isolates in experimental calf infection studies.

Since naturally-occurring pneumonia in cattle or neonatal calf diarrhea typically involves infection of the host with more than one infectious agent, we are also studying the interaction of BVDV with BRSV or bovine rotavirus in concurrent *in vivo* and *in vitro* infections.

Teaching responsibilities include serving as major advisor for graduate students, mentoring undergraduate students conducting thesis research projects, and as course instructor. I am the sole instructor for two courses, Principles and Prevention of Livestock Diseases and our departmental undergraduate capstone course: Integrated Principles and Prevention of Livestock Diseases. Each year, I have also contributed guest lectures in immunovirology or vaccinology courses.

Marjorie F. Lou, BS, MS, PhD
Professor

Biochemistry/Biomedical Sciences
Appointment: .90 FTE Rsch; .10 FTE Tchg

Main Focus: Biochemical Mechanism of Senile Cataract Formation

Our focus on the biochemical mechanism of age-related cataract formation is oxidative stress. We used hydrogen peroxide-induced cataract in organ culture condition as our model to study the progressive changes in morphology and intracellular redox potential in the lens. We demonstrated that lens opacification is associated with the increased protein insolubility and protein aggregation, resulting from lens protein oxidation by oxidative stress. We also showed that the thiol groups in lens proteins are oxidized by forming protein-thiol mixed disulfides first followed by protein protein disulfide formation, a condition that will lead to lens opacification. We studied the site of thiolation on lens proteins by using mass spectrometry and found a direct evidence that protein thiolation caused change in protein conformation, thus supporting our hypothesis that protein-thiol mixed disulfide formation plays an important role in cataractogenesis.

We discovered that the lens has an intrinsic repair enzyme systems, the thioltransferase/ GSH and thioredoxin/thioredoxin reductase/NADPH systems, which can repair the damaged lens proteins/enzymes and restore their biological functions. We cloned, sequenced and characterized these enzymes and found them to be extremely oxidant-resistant in the lens epithelium cells. The physiological function of the two repair systems is proposed to be oxidative stress defense enzymes by preventing the accumulation of oxidant induced protein-protein disulfide in the lens and to regulate the thiol/disulfide homeostasis so that the lens will not be permanently damaged by oxidative stress.

Redox Signaling in the Lens Epithelial Cells

We examine the physiological function of reactive oxygen species in promoting cell growth and differentiation in the lens. This is a new research direction, which requires a lot of knowledge in signal transduction and the redox biology combined. We are using a growth factor, PDGF, as a model to study the mechanism of the mitogenic action of PDGF in cell proliferation. We now have extensive data suggesting that a growth factor binding can trigger generation of reactive oxygen species (ROS) via the membrane enzyme NADPH oxidase. ROS is then used by the cells to inhibit phosphatases, so that phosphorylation (activation) of signaling components, such as the MAPK cascades, can be initiated. We are also working on the regulation of this redox signaling system and investigating several transcription factors in the nucleus that are associated with gene expression under such experimental conditions.

Cataract Models

Our effort is also to establish a cataract model relevant to humans. We have recently developed a thioltransferase kockout mouse model, which showed lens protein aggregation as the animal aged beyond 13 months old, while the age-matched wild type remained normal. Thus, this is a model very much mimicking human age-related cataract. We plan to use this model to study the benefit of using various antioxidants and examine their efficacy against protein aggregation, including using thioltransferase, which is lacking in the lens of these animals.

Fernando A. Osorio, MV, MS, PhD, ACVM
Professor

Virologist
Appointment: .60 FTE Rsch; .40 FTE Diag Srv

My research centers on pathogenesis of viral infections. In the last decade we have focused on a major viral agent that affects swine: Porcine Reproductive and Respiratory Syndrome Virus (PRRSV, an arterivirus, ssRNA+ genome). PRRSV currently causes the most economically significant infectious disease of US swine stock. Our initial interest in this disease centered on the primary characterization of the cell tropism of this virus *in vivo*. We initially detected and characterized a novel tropism of PRRSV for male germ cells. Such a specialized tropism of PRRSV results in death of these cells by (*in vivo*) induction of apoptosis. This selectivity for testicular germ cells also explains the transmission of PRRSV via semen, one of the most imporatnt routes of dissemination of this agent. We have also further characterized the immunobiology of persistence of this virus in convalescent animals. Our research seems to indicate that, contrary to other known examples of RNA virus persistence, the persistent infection established by PRRSV is finite and seems to involve a low level of productive infection that progressively declines until complete viral clearance takes place. We found that during the period of viral persistence, extensive modulation of the homologous (PRRSV-specific) cell-mediated and humoral immune response takes place. We are particularly interested in the mechanisms responsible for establishment of protective immunity against PRRSV. There is an urgent need for improvement of the vaccines that are currently used against PRRSV. We have discovered that a major role for protection against infection and disease caused by PRRSV resides with a type of PRRSV-specific antibodies that has the ability to render PRRSV un-infectious (i.e. antibodies that neutralize PRRSV). The key to a better protection against PRRSV resides on the development of better and safer vaccines that would prevent infection and possess more genetic stability than the commercial attenuated vaccines currently in use. To that end, we are interested in: 1) characterization of the major immunogenic components of PRRSV, and 2) characterization of the genes responsible for the ability to produce disease (virulence) by PRRSV. Knowing the genetic basis of PRRSV virulence and attenuation should permit a more precise design of safer, more efficacious vaccines.

Diagnostic Service: As the director of diagnostic virology at the Veterinary Diagnostic Center, my main goal has been to expedite the diagnostic process through the implementation of rapid tests that are based on the direct detection of viral components or anti-viral antibodies in the clinical sample. I am particularly interested on the evaluation of the fitness and robustness of new commercial diagnostic serologic kits for PRRSV and for Foot-and-Mouth Disease Virus (FMDV). In the latter case, the differential (i.e. capable of distinguishing infected from vaccinated animals) kits for FMDV may be of cardinal importance to US Agriculture, in case any form of vaccination is considered as a viable rapid response against a possible outbreak of this disease in the US. Another major responsibility as diagnostic virologist is my maintaining an active diagnostic surveillance for Pseudorabies Virus (PRV) , a very important herpesvirus that has been recently eradicated of domestic swine in the U.S. Our diagnostic virology lab serves as reference for other labs nationwide in relation to molecular detection of PRV in tissues of animals suspects of PRV infection.

Regarding teaching, I collaborate with team teaching of virology courses. Together with Dr. Charles Wood, I co-teach a course on Advanced Viral Pathogenesis and collaborate with a team teaching of Advanced Viral Immunology.

Asit K. Pattnaik, BS, MS, PhD
Associate Professor

Virologist
Appointment: .80 FTE Rsch; .20 FTE Tchg

My research focuses on various aspects of viral genome transcription, replication, and virus assembly in cells infected with viruses. As model systems for these studies, we use vesicular stomatitis virus (VSV), a non-segmented negative-strand RNA virus, hepatitis C virus (HCV), a positive-strand RNA virus, and porcine reproductive and respiratory syndrome virus (PRRSV), another positive-strand RNA virus. VSV is a cattle pathogen but has been widely used as a paradigm for understanding of biology of this group of RNA viruses that include some of the most serious human pathogens. HCV is a significant human pathogen for which no effective antiviral therapy is currently available. PRRSV causes economically significant diseases in swine population.

In recent past, our research has been centered on the understanding the mechanism of VSV genome transcription and replication. We have generated plasmids encoding subgenomic replicons of VSV that when transfected into mammalian cells, faithfully reproduce the processes of transcription and replication that is normally observed in virus-infected cells. Using the system of reverse genetics that I developed several years ago, we have examined many different aspects of the mechanisms of this virus genome transcription and replication. We have proposed a model suggesting that nucleotide sequences present at the beginning and the end of each gene coding sequences of VSV contain regulatory signals that mediate synthesis of five individual mRNAs from the large viral genome in infected cells. In addition, in a separate model, we have proposed that differential phosphorylation of one of the key viral proteins (the phosphoprotein, P) regulates the transcription and replication functions of the viral RNA polymerase. Logical ongoing studies are directed at generating and characterizing mutant viruses with defects in the P protein so that it may be possible to create viruses with attenuated phenotypes for development of viral vaccines.

In the area of HCV, we are attempting to develop a system for replication of subgenomic replicons in transfected mammalian cells. These are extremely challenging studies, but if successful, will advance the field significantly. For these studies, we have generated a variety of HCV subgenomic replicons and are currently examining their ability to replicate in transfected cells. In addition, our studies are directed at generating infectious HCV from mammalian cells. Currently, attempts to develop antiviral therapy against this virus are hampered by the lack of a system to grow and propagate the virus in cultured cells.

With PRRSV, we have generated a full-length cDNA clone of the viral genome in a transcription vector. In vitro transcripts generated from the cDNA clone when transfected into MARC-145 cells resulted in production of infectious recombinant PRRSV from the cells. The recombinant PRRSV generated from the cDNA exhibited pathogenic properties similar to that of the parental virus. We are currently using this reverse genetic system to determine the virulence and attenuation determinants of PRRSV. Results from these studies will be significant in our attempt to develop safe and more efficacious vaccine to combat PRRS. Using infectious VSV cDNA clone, we are also generating recombinant VSVs containing PRRSV genes to examine cell-mediated and humoral immune response to the specific PRRSV proteins.

Douglas G. Rogers, BS, DVM, MS, PhD
Professor

Pathologist
Veterinary Diagnostic Center
Appointment: 1.0 FTE Diagnostic Service

My major responsibility within the Department of Veterinary and Biomedical Sciences and within the Veterinary Diagnostic Center is diagnostic veterinary medicine. As a diagnostic pathologist, the position requires the histopathologic examination of diseased tissues, performing necropsies, assimilation and evaluation of supportive laboratory data, reporting to referring veterinarians or animal owners, preparing the laboratory reports and researching pertinent scientific literature. My special interest is conducting field investigations relative to infectious disease of livestock. This position has afforded me several opportunities to identify "new" infectious diseases of livestock and also to identify "new trends" of "old diseases." The ultimate goal of these investigations has been (and will be) to establish intra- and inter- institutional collaborative studies on the pathogenesis of infectious diseases of livestock. My teaching responsibilities include the training of graduate students/residents interested in diagnostic veterinary medicine, advising graduate students (as major advisor or committee member), conducting research on bacterial diseases of livestock.

Gary P. Rupp, DVM, MS, ACT Diplomate
Professor & Director

Theriogenology
Great Plains Veterinary Educational Center
Clay Center, Nebraska
Appointment: .50 FTE Tchg: .30 FTE Rsch;
.20 FTE Srvc

As Director of The University of Nebraska Great Plains Veterinary Educational Center I work with other Departmental faculty to provide instruction in clinical and applied areas of production management and specialized health care for veterinary students in the professional curriculum of the joint KSU/UNL program. This mission is accomplished through another important activity, which is providing health and production management services for the U. S. MARC livestock in concert with the Herd Health Veterinarian. The combination of duties provides an excellent opportunity for student experience in clinical veterinary medicine and livestock management.

An additional aspect of our Center is that of providing continuing education programs for graduate veterinarians. This activity requires working with a wide array of allied specialists in the diverse areas involved in the beef cattle industry. We are just finished providing the eighth Beef Cattle Production Management Series which increases our total participation to more than 140 veterinarians. They represent beef cattle practitioners from across the United States and Canada and also from other aspects of the animal health industry. During the past 3 years this educational series has evolved into an optional graduate program which usually leads to an MS degree through distance education but has contributed to several PhD programs as well. The Series is currently being taught by University from Animal Science, Agronomy, Agricultural Economics, Veterinary Science from the University of Nebraska and educators from Kansas State University, Iowa State University, the University of Missouri, Texas A&M University, as well as specialists from other beef industry perspectives.

Research by faculty involves projects conducted in cooperation with U. S. Meat Animal Scientists and with cooperating producer herds and private feed yards in Nebraska. Recent efforts have been associated with reproduction, antibiotic residues, and tracking calves through retained ownership from birth to processing. The development of biosecurity and quality assurance programs for beef producers, and work to prevent and control foodborne pathogens. Additional projects have been carried out in areas of neonatal health and production.

In the future the GPVEC program hopes to further expand the interaction of other colleges of veterinary medicine and related disciplines to broaden the teaching and industry exposure for graduate veterinarians and allied specialists to provide a broad and in-depth coverage of production, management, economic, and health related issues essential for providing service to progressive livestock producers.

Our faculty wish to continue improving our involvement in areas of clinically related research, extension, and veterinary service to MARC, Nebraska producers, and the entire livestock industry. This can best be accomplished through our cooperation and interactive participation in education, research, and service commitments. The benefits of distance education and other innovative multimedia technologies are gradually increasing general knowledge and will enhance our service to the livestock industry.

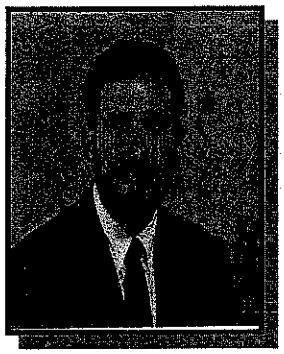
John A. Schmitz, DVM, PhD
Professor

Pathologist
Appointment: .45 FTE Tchng; .55 FTE Diag

Since July 2004, I assumed the position of Professor in the VBMS Department. Due to space limitations in VBS and VDC buildings, I occupied a temporary office in the Animal Sciences Building. My duties included participating in the diagnostic pathology rotation in the Veterinary Diagnostic Center and teaching two courses during Fall Semester 2004. I taught VBMS 101, Introduction to Animal Health Careers (1 cr) for the first time, taking this course over after the retirement of Dr. Schneider the course originator. I also taught VBMS 408, Functional Histology; thus, implementing a new schedule of teaching this course in the Fall rather than in the Spring Semester, as previously provided. This scheduling change reduces the number of core VBMS courses our undergraduate majors have to take during Spring Semester.

During this period, I initiated a draft of a research project on BVDV in cooperation with Dr. Gary Rupp and other members of the VBMS Department. It is expected that this project will be initiated in 2005. I also lead an initiative, with Dr. Rupp and others, to conduct a survey of Nebraska veterinarians to determine factors that influence decisions by veterinarians to live and practice in rural communities and to provide veterinary services for food animals. Identification of such factors may aid the Nebraska Veterinary Student Selection Committee in admitting students that are more likely to serve these communities and industries after they graduate from veterinary medical college. The survey was sent out to approximately 700 graduate veterinarians in Nebraska. It is anticipated this project will be completed sometime in 2005.

David R. Smith, BS, DVM, PhD, Dipl. ACVPM (Epidemiology)
Associate Professor



Extension Dairy and Beef Veterinarian
Appointment: .75 FTE Ext; .25 FTE Rsch

The goals of my research and extension programing are to contribute new knowledge and apply existing knowledge to solve animal and public health problems associated with dairy and beef production systems. I conduct research on, and communicate applications of, biosecurity and pathogen containment to control pathogens that affect dairy and beef cattle health and pre-harvest food safety.

My current research and extension efforts are directed towards animal production food safety related to *Escherichia coli* O157:H7 and *Salmonella* in feedlot cattle, evaluating herd-level diagnostic approaches for Johne's disease and bovine viral diarrhea in dairy and beef cattle, and evaluating new production systems to prevent calf scours on Nebraska Sandhills ranches.

Greg A. Somerville, BS, MS, PhD
Assistant Professor

Infectious Disease Specialist/Microbiologist
Appointment: .90 FTE Rsch; .10 FTE Tchng

S. aureus and *S. epidermidis* are the two leading causes of nosocomial infections in the USA, resulting in dramatically increased morbidity and treatment costs. Additionally, *S. aureus* is a major cause of bovine mastitis, a disease costing the USA approximately $2 billion annually, due to reduced production, animal replacement costs, discarded milk, treatment costs, and veterinary fees. My research focuses on addressing how environmental conditions affect the bacterial metabolic status and, in turn, how the metabolic status affects staphylococcal virulence. This is particularly important in the era of "omics," when genomics, proteomics, and high throughput mutagenesis screens consistently identify the genes of bacterial physiology and metabolism as being important, or essential, for pathogenesis. Currently, my lab is working on identifying the intermediary metabolism derived signals in *S. aureus* that facilitate the transition from a commensal state to a pathogenic state. The long-term goal of my research is the elucidation of mechanisms by which *Staphylococcus aureus* and *S. epidermidis* controls virulence factor production in response to metabolic and environmental stimuli. It is anticipated that by understanding the mechanisms of virulence regulation in response to environmental stimuli that vaccines can be developed that will attenuate the bacterial response to the host environment.

David J. Steffen, BS, DVM, PhD, ABVP
Associate Professor & Director

Diagnostic Pathologist
Veterinary Diagnostic Center
Appointment: 1.0 FTE Diagnostic Service

My appointment in the Nebraska Veterinary Diagnostic Center is to serve as the Director and as a Diagnostic Pathologist. The scholarly component involves making use of case materials. A regular funded congenital defects referral center was established and I was actively investigating Dwarfism in Angus cattle. I am working with the Angus and Hereford Associations to update their genetic disease control policies. Collaboration with Dr. Kelling on BVDV infections in calves is ongoing as is collaborative studies in West Nile virus infection in horses. Laboratory accessions continue to rise.

Major time commitment is toward providing administrative guidance to the Diagnostic Center and providing diagnostic and consultation services to the Nebraska livestock industry. I serve as a case coordinator on 1300-1400 investigations per year, which involve a multi-disciplinary approach to disease diagnosis. All cases culminate in a written report to the veterinarian and/or the animal owner, and often telephone consultations regarding disease management.

Arden R. Wohlers, BS, DVM
Extension Assistant Professor

Beef Cattle Health and Production Management
Panhandle Research & Extension Center
Scottsbluff, NE
Appointment: .50 FTE Extension Services

My 0.50 FTE position includes veterinary education responsibilities at the UNL Panhandle Research and Extension Center. The principal goal for my position is to contribute to the viability and growth of the animal agriculture industries in western Nebraska, especially the beef cattle industry and public health. I am responsible for coordination and cooperation with faculty and staff located at PHREC and other research and extension centers, VBMS, GPVEC and other UNL units.

I am responsible for development, coordination and implementation of educational programs that are sensitive to the needs of animal owners, veterinary practitioners, extension personnel and wildlife managers. My programs relate to animal health and production management that is pertinent to industry.

I deal with one on one conferences concerning isolated disease or management problems on a daily basis. An emphasis is placed on biosecurity applications for animal production systems. Currently my focus programs are the IRM pen of 5 demonstration project, foreign animal disease and agroterrorism issues and the planning for a beef industry discussion group to be implemented in the future. I am involved in the study of veterinary needs of the future in rural Nebraska.

Yange Zhang, BS, MS, PhD
Research Assistant Professor

Molecular Biologist
Appointment 100% Research

Functional analysis of the bICP0 encoded by bovine herpes virus immediate early gene

Objective: Identification of functional domain of bICP0

Bovine herpesvirus type 1 (BHV-1) is a family member of alphaherpesvirus and it shares a number of biological properties with herpes simplex virus type 1 (HSV-1). BHV-1 infection can cause conjunctivitis, pneumonia, genital disorders, abortions, occasionally encephalitis, and a complex upper respiratory infection referred to as 'shipping fever'. BHV-1 also establishes life-long latent infections in sensory ganglionic neurons and can be reactivated periodically upon stress or immunosupression. During productive infection, BHV-1 gene expression is divided into three phases: immediate-early (IE) genes, early (E) genes, or late (L) genes. bICP0 is expressed at high levels throughout productive infection because it is translated from an IE (IE2.9) or E mRNA (E2.6), and accumulates in nuclei of infected cells. bICP0 is important for productive infection, it can activate all three classes of viral promoter. In transient transfection assays, bICP0 functions as a potent transactivator of viral promoters. bICP0 can also regulate cellular promoters. For example, bICP0 relieves mad/max mediated transcriptional repression through its association with histone deacetylase 1. bICP0 also inhibits the human interferon ß promoter, in part, by sequestering the coactivator p300. These results indicate that bICP0 is the major viral regulatory protein. bICP0 contains a zinc Ring finger located near its amino-terminus, which is well conserved among all ICP0 homologues encoded by alphaherpesvirinae subfamily members. The zinc Ring finger of bICP0 is important for transcriptional activation and productive infection. In this study, we demonstrate that the C-terminal amino acids spanning 607 to 676 contained nuclear localization signal (NSL). Deletion of this region altered the cellular localization of bICP0 and reduced its ability to activate the herpes simplex virus thymidine kinase (TK) promoter. A panel of bICP0 mutants generated by random transposon insertion revealed two additional domains, amino acids 78 to 256, and amino acids 457 to 470 that were necessary for efficient trans-activation. Insertion of transposon within amino acid 91W severely impaired the ability of bICP0 to be expressed stably in transiently transfected cells. This effect appeared to be proteosome independent. Insertion of transposons into the acidic domain of bICP0 had no effect on the transactivation activity or protein expression. Confocal microscopy revealed that none of the mutants appeared to alter the cellular localization. Taken together, these studies indicated that bICP0 had several functional domains; 1) the zinc Ring finger domain that stimulates productive infection and influences cell survival, 2) the C-terminal nuclear localization signal (NSL), 3) two independent transcriptional activation domains. Understanding the mechanism of how bICP0 regulates viral or cellular gene expression may lead to innovative antiviral strategies. For example, identification of bICP0 mutant virus strains that have reduced growth potential, but do not block IFN signaling could be a superior modified live vaccine.

Y. "Joe" Zhou, BSc, PhD
Research Associate Professor

Cell Biologist
Manager, Microscopy Core Research Facility
Center for Biotechnology
Appointment: .70 FTE Managing & Srv;
.20 FTE Rsch; .10 Training & Tchg

As Manager for the Microscopy Research Core Facility, Center for Biotechnology, my main goal has been to establish and maintain the-state-of-art microscopy imaging facility, which provides expertise and instrumentation to researchers within/outside UNL. I am also actively involved in research collaborations and in providing technical support for seeking research funding. One of the major research and service projects involves the use of immunochemical labeling and digital imaging technology to support an NIH-funded collaborative study of viral pathogenesis by a group of scientists from UNL, UNMC and UNC. Microscopy imaging technologies we provide include: a) immunofluorescence microscopy using whole tissues or sections, b) multi-probe *in situ* hybridization, c) real-time imaging confocal microscopy (i.e. detection of GFP-tagged proteins in live cells in cultures and d) transmission and scanning electron microscopy.

My research is focused on genetic and environmental effects on stress responsiveness in relation to age-related neurodegeneration using animal models. The goal of my research is to establish a mouse model of altered stress response in order to identify and characterize the genes/proteins associated with or affecting stress susceptibility and aging. One of the ongoing projects, in collaboration with Dr. MK Nielsen of Animal Sciences, is genetic selection of mouse lines with high and low responsiveness to stress, in order to establish a useful mouse model of stress-induced early aging and neurodegeneration. Molecular events associated with stress-induced abnormalities remain ambiguous despite scientific advancement, owing to the complexity of genetic and environmental interactions. Many experimental paradigms have been used to study the mechanisms of stress responses in animals, but to date there is no well-documented animal model generated from genetic selection for altered corticosterone response to stress to facilitate the study of stress-induced changes in gene expression with relation to behavioral abnormalities. We recently initiated genetic selection of two mouse lines for high and low stress responsiveness (SH and SL lines, respectively), using serum corticosterone as one of the key criteria. After completion of the selection process for the second generation, the SH mice displayed up to twice the level of serum corticosterone observed in the SL mice (with or without exposure to stress). The initial microarray using the SH/SL mouse brains revealed significant differences in expression of many genes between the stressed and control mice within the same line and between the two genotypes. I, therefore, *hypothesize* that the difference in stress responses between the SH and SL lines results from complex genetic alteration (mainly in differential gene expression), and in mechanisms of central response to stress that were applied throughout the genetic selection process. Major focuses of my research are 1) *In vitro* characterization of biochemical properties and functional integrity of primary cultured hippocampal neurons derived from the embryonic SH and SL mice; 2) Assessment of behavioral activity and cognitive performance and subsequent gene expression profiling in the SH and SL mice in response to stress; and 3) Gene expression profiling and behavioral/cognitive assessments in the SH and SL mice in response to chronic stress in relation to the aging process in order to identify age-related genes associated with high or low susceptibility to chronic stress. This research is expected to foster an increased understanding of the molecular and biochemical events associated with neuronal calcium/kinase signaling and with regulation of genetic and environmental interactions in the mechanisms of stress.

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES RESEARCHERS, POSTDOCTORAL RESEARCH ASSOCIATES AND SENIOR RESEARCH ASSOCIATES, 2005

Name **Ofelia Chaćon-Barletta** **Title: Postdoctoral Research Associate**
Mentors Raúl G. Barletta, University of Nebraska-Lincoln and G. Adams, Texas A&M University
Degree(s) **MSc** – January 1995 – University of Antioquia, Colombia (Immunology)
MD – July 1991 – University of Antioquia, Colombia (Physician and Surgeon, General Practice)
PhD – December 2002 – Texas A&M University, Texas (Microbiology)

Name **Subash C. Das**[1] **Title: Postdoctoral Research Associate**
Mentor Asit K. Pattnaik
Degree(s) **BSVc** – September 1987 – College of Veterinary Science, Orissa, India (Veterinary Science & A.H.)
MVSc – 1991 – Ivro, Izatnager, U/P. India (Veterinary Immunology)
PhD – 2000 – University of London, Surrey, U.K. (Veterinary Molecular Virology)

Name **Shuanghu Liu**[2] **Title: Senior Research Associate**
Mentor Asit K. Pattnaik
Degree(s) **BS** - June 30, 1986 - Zhongshan Medical University, Guangzhou, China (Medical)
MD - June 30, 1991 - Hunan Medical University, Hunan, China (Hepatology and Infectious Diseases)
PhD - June 30, 1995 - Hunan Medical University, Hunan, China (Hepatology and Infectious Diseases)

Name **Weiping Peng** **Title: Senior Research Associate**
Mentor Clinton J. Jones
Degree(s) **BS** - July 25, 1982 - Anhui Agricultural University - China (Sericulture)
MS - December 26, 1986 - Anhui Agricultural University - China (Silkworm genetics and breeding)
PhD - March 4, 2000 - Chinese Academy of Agricultural Sciences, China (Silkworm genetics and breeding)

Name **Yunquan Jiang**[2] **Title: Researcher**
Mentor Clinton J. Jones
Degree(s) **BS** - March 1, 1970 - People's Republic of China - Peking University (Biochemistry)

Name **Emil M. Berberov**[2] **Title: Researcher**
Mentor Rodney A. Moxley
Degree(s) **MSc** - October 7, 1987 - Sofia, Bulgaria - Sofia University (Zoology)
PhD - April 14, 1993 - Moscow, Russia - Vavilov Institute of General Genetics (Genetics)

Name **Bonggoo Park**[2] **Title: Postdoctoral Research Associate**
Mentor Jeffrey D. Cirillo
Degree(s) **BS** - February 25, 1992 - Korea University, South Korea (Agricultural Chemistry)
PhD – December 10, 2001 – Oklahoma State University, Oklahoma (Biochemistry & Molecular Biology)

Name **Mustapha Moulay Samrakandi** **Title: Researcher**
Mentor Jeffrey D. Cirillo
Degree(s) **BS** - June 1985 - Marrakech, Morocco - Sahnoun College (Experimental Sciences)
MS - September, 1990 - France - University of Sciences Toulouse III (Biochemistry)
Post-Graduate Diploma - September 1991 - France - Polytechnic National Institute - Toulouse III (Phytrsanitary and Antiparasitic Agrochemistry)
PhD - February 1996 - France - University of Sciences Toulouse III (Microbiology)

Name **Christina Topliff** **Title: Postdoctoral Research Associate**
Mentor Clayton L. Kelling
Degree(s) **BS** – May 1985 – Kansas State University, Manhattan, KS (Veterinary Science)
MS – December 1995 – University of Nebraska-Lincoln, Lincoln, NE (Veterinary Science)
DVM – May 1987 – Kansas State University, Manhattan, KS
PhD – December 2004 – University of Nebraska-Lincoln, Lincoln, NE (Integrative Biomedical Sciences)

Name **Amit Kumar Pandey**[2] **Title: Postdoctoral Research Associate**
Mentor Jeffrey D. Cirillo
Degree(s) **BSVc** – 1996 – Orissa University of Agriculture and Technology, Bhubaneswar, India (Veterinary Science)
MSc – 1999 – National Dairy Research Institute, Karnal, India (Animal Biotechnology)
PhD – 2003 – Indian Veterinary Research Institute, Bareilly, India (Animal Biotechnology)

Name **Selvakumar Subbian**[2] **Title: Postdoctoral Research Associate**
Mentor Jeffrey D. Cirillo
Degree(s) **BS** – April 1993 – Bharathiyar University, Tamilnadu, India (Biochemistry)
MSc – April 1995 – University of Madras, Tamilnadu, India (Biomedical Genetics)
PhD – April 2003 – Tuberculosis Research Centre (The Tamilnadu Dr. MGR Medical University), Tamilnadu, India (Basic Medical Sciences)

Name **Kuiyi Xing**[1] **Title: Senior Research Associate**
Mentor Marjorie F. Lou
Degree(s) **BS** - July 15, 1991 - Fudan University, Shangaahi, People's Republic of China (Biochemistry)
PhD - December 20, 2002 - University of Nebraska-Lincoln (Biochemistry)

University of Nebraska Lincoln

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES
Office of the Dean

November 10, 2005

TO: IANR Faculty Involved in CASNR Instruction/Advising

FROM: Steve Waller
Dean

SUBJECT: *Academic Appointment Summary*

Enclosed is a summary of your calculated FTE for the 2004-2005 academic year (Fall 2004, Spring 2005, Summer 2005). This is a measure of effort, not quality of instruction or advising. The CIEQ, Peer Review and Student Outcomes Assessment provide opportunities to address quality. The documentation for the Academic Appointment is on the CASNR website at http://casnr.unl.edu/facstaff/forms.htm

We have provided a format for the academic appointment summary that identifies the contributions of each category (Advising, Adjustments and Instruction) to the total calculated FTE. If you are on an academic year appointment, the calculated FTE has been adjusted. The budgeted FTE is taken from the 2004-2005 Departmental Budget Listing and will not reflect changes made after April 1, 2004. Mid-year adjustments in your budgeted FTE are considered during the evaluation process. Also enclosed is your historical summary for total calculated FTE. Please contact Associate Dean Jack Schinstock if you have any questions about the enclosures. Our goal is to provide this summary prior to your submission of your ARFA.

Although completing the *Academic Appointment Information Sheet* is time consuming and may appear more bureaucratic than necessary, it has proven to be very accurate College-wide. It allows you, your unit administrator and the College to make knowledgeable decisions regarding workload adjustment and resource allocation. As helpful as it is within the College, its benefit is even greater when campus administration is evaluating academic appointments across colleges.

CASNR is the only college with substantial quantitative documentation. Our process acknowledges important components of the academic appointment that cannot be measured by student credit hour production alone. Consequently, the data that you help us collect has greatly strengthened our position in discussing faculty load among the other colleges. For that I am grateful and appreciate your time and effort invested in helping us each year with this activity.

Encl: Academic Appointment Summary (2004-2005)
Academic Appointment History

cc: IANR Deans' Council w/o encl.

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VETERINARY AND BIOMEDICAL SCIENCES TREND

10-Year Report	Calculated FTE[1]											
	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07		Comments
Name	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE[2]	Budgeted FTE[3]	
Barletta	15	13	12	13	11	9	5	6	16	21.9	10	
Duhamel	5	3	3	8	9	8	6	6	8	0	10	
Jones	13	18	18	16	29	14	24	22	37	25.7	10	
Kelling	21	29	32	35	39	40	43	34	33	38.5	35	.35 FTE 7/02
Moxley	15	28	16	25	15	18	28	25	30	30.1	10	
Schmitz	20	32	31	33	31	37	37	18	0	0	45	Left Univ.
Sub-Totals							143	111	124	116.2	120	
Contract/Other Teaching Faculty												
Berg										128.1	0	
Brodersen						1	11	12	3	3.6	0	
Carlson							21	17	18	31.1	0	Contract 7/03
Doster				1	0	1	4	9	6	9.5	0	
Griffin										6.3	0	
Hardin L										6.8	0	
Kammerman										24.1	0	
Lou										7.6	0	
McVey										4.7	0	
Ondrak										20.1	0	
Pattnaik						4	7	13	21	15.7	0	Start 8/02 (Virology)
Rogers				2	1	2	9	9	10	4.5	0	
Rupp										21.5	0	
Smith										1.1	0	
Somerville								7	18	16.5	0	Start 8/04 (Redox)
Zhou						1	2	3	3	2.7	0	
Sub-Totals							54	70	79	303.9	0	
TOTALS							300	274	203	420.1	120	

[1] The CASNR Academic Appointment - Philosophy and Guidelines (Sept. 2003)

[2] Based on Fall 2006, Spring 2007, Summer 2007

[3] Fiscal Year 2006-2007, Departmental Budget Listing

02/14/2008

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES TEACHING PROGRAM - COURSES, 2005

Course #	Course Title Cross listing	Credit Hours, Semester
VBMS 101	Introduction to Animal Health Careers	1 cr, I
VBMS 303	Principles and Prevention of Livestock Diseases	3 cr, II
VBMS 403	Integrated Principles and Prevention of Livestock Diseases	4 cr,
VBMS 408	Functional Histology Lec 2, lab 2	4 cr, II
VBMS 410	General Pharmacology and Toxicology	3 cr, II - Lec 3
VBMS 416	Veterinary Entomology/Ectoparasitology (Animal Science; Entomology; Forestry, Fisheries and Wildlife 416/816)	2cr, II
VBMS 424	Basic Molecular Infectious Diseases	3 cr, II, even numbered yrs
VBMS 441	Pathogenic Microbiology (Biological Sciences 441/841)	3 cr, II
VBMS 452	Introduction to Molecular Virology and Viral Pathogenesis	3 cr, I
VBMS 488	Exploration of Production Medicine	2 cr, III - Lec 2
VBMS 496	Independent Study in Veterinary Science	1-5 cr, I, II
VBMS 499H	Honors Thesis	3-6 cr, I, II, III
VBMS 805	Introduction to Mechanisms of Disease	3 cr, II
VBMS 808	Functional Histology	4cr, II Lec/Lab
VBMS 811	Introduction to Veterinary Epidemiology	2 cr, III - Lec/Disc/Lab
VBMS 816	Veterinary Entomology/Ectoparasitology	2 cr, II
VBMS 816L	Veterinary Entomology/Ectoparasitology	1 cr, I
VBMS 818	Computer-aided Sequence Analysis Primer	2 cr, I
VBMS 820	Molecular Genetics (420/820) (BioSci 820)	3 cr
VBMS 824	Basic Molecular Infectious Diseases	3cr, II
VBMS 838	Molecular Biology Laboratory (BioSci 838)	5 cr, III
VBMS 840	Microbial Physiology (BioSci 840)	3 cr
VBMS 841	Pathogenic Microbiology (BioSci 841)	3 cr, II Lec/Lab
VBMS 842	Endocrinology (AnSci 842, BiolSci 842)	3 cr, I
VBMS 843	Immunology (BioSci 843)	3 cr

Course #	Course Title Cross listing	Credit Hours, Semester
VBMS 845	Animal Physiology I (AniSci 845, BioSci 813)	4 cr, I Lec/Lab
VBMS 847A&B	Interdisciplinary Concepts in Beef Production	4 cr, I, II
VBMS 848	Introduction to Veterinary Biotechnology	1-2 cr, II
VBMS 852	Molecular Virology and Viral Pathogenesis	3 cr, I
VBMS 899	Masters Thesis	6-10 cr , I, II, III
VBMS 901	Diagnostic Techniques	1-10 cr, I, II
VBMS 909	Seminar	1-4 cr, I, II
VBMS 919	Regulation of Eukaryotic Gene Expression	3 cr, II
VBMS 920	Measurement of Animal Disease and Production	2 cr, I
VBMS 921	Analytic Observational Studies in Veterinary Epidemiology	2 cr, I
VBMS 925	Critical Reading of the Epidemiology Literature	1-6 cr, II
VBMS 930	Advanced Food Animal Production Medicine	2 cr, II (even yrs)
VBMS 942	Microbial Genetics	3 cr
VBMS 944	Immunovirology (BioSci 944)	3 cr
VBMS 948	Concepts in Experimental Immunology (BioSci 948)	3 cr, II
VBMS 949	Vaccinology	3 cr, II, alternate yrs
VBMS 950	Medical Molecular Virology (BioSci 950)	3 cr, I
VBMS 951	Advanced Molecular Infectious Disease	3 cr, II
VBMS 964	Signal Transduction (BioSci 964)	3 cr
VBMS 966	Advanced Viral Pathogenesis (BioSci 966)	3 cr (alternate yrs)
VBMS 975	Seminar in Veterinary Histopathology	1 cr, I, II
VBMS 996	Research on Selected Problems in Veterinary Science	1-10 cr, I, II
VBMS 998	Special Topics in Veterinary Science	1-10 cr, I, II
IBMS 999	Doctoral Dissertation	1-10 cr, I, II, III

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
2005 ENROLLMENT

Spring, Semester, 2005

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 303	Preventive Livestock Diseases	Kelling	17	51
VBMS 403	Capstone:Issues Ani Health	Kelling	10	40
VBMS 441	Pathogenic Microbiology	Moxley	12	36
BIOSCI 441	Pathogenic Microbiology	Moxley	6	18
VBMS 496	Independent Study	Cirillo/Kelling	2	5
BIOS 841	Pathogenic Microbiology	Moxley	3	9
VBMS 847B	Beef production II	Rupp	4	12
VBMS 848	Intro to Veterinary Biotech	Rupp	3	3
VBMS 899	Masters Thesis	Staff	6	17
VBMS 909	Seminar	Moxley	16	16
VBMS 925	Epidemiology Lit	Rupp	2	2
VBMS 951	Advanced Mol Infect Diseases	Cirillo/Barletta	2	6
VBMS 975	Vet Histopathology	Brodersen	1	1
VBMS 996	Research Problems	Staff	13	51
VBMS 998	Advanced Systemic Pathology	Steffen	1	4
VBMS 998	Clinical Trials	Rupp	4	8
IBMS 999	Doctoral Dissertation	Staff	3	16

Eight Week Session, Summer

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 996	Research Problems	Staff	1	2

First Five-Week Summer Session, 2005

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 899	Masters Thesis	Staff	13	34
VBMS 975	Vet Histopathology	Brodersen	1	1
IBMS 999	Doctoral Dissertation	Staff	2	6

Second Five-Week Summer Session, 2005

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 496	Independent Study	Steffen	1	1
VBMS 899	Masters Thesis	Osorio	1	3
VBMS 996	Research Problems	Staff	11	33
IBMS 999	Doctoral Dissertation	Staff	3	9

Fall Semester, 2005

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 101	Animal Health Careers	Schmitz	24	24
VBMS 408	Functional Histology	Schmitz	10	40
BIOS 408	Functional Histology	Schmitz	1	4
VBMS 410	Pharmacology/Toxicology	Carlson	13	52
VBMS 496	Independent Study	Kelling	1	2
VBMS 499H	Honors Thesis	Kelling/Rogers	2	6
BIOS 808	Functional Histology	Schmitz	1	4
VBMS 899	Masters Thesis	Kelling/Osorio	2	5
VBMS 909	Seminar	Rogers	17	17
VBMS 950	Medical Molecular Virology	Jones/Pattnaik	8	24
VBMS 996	Research Problems	Staff	13	58
VBMS 998	Intestinal Histopathology	Moxley	3	6
VBMS 998	General Pathology	Steffen	1	3
IBMS 999	Doctoral Dissertation	Staff	1	5

UNDERGRADUATE ENROLLMENT

2005 Spring Semester Enrollment

Veterinary Science Major	67
Pre-Veterinary Medicine Major	3

2005 Fall Semester Enrollment

Veterinary Science Major	87
Pre-Veterinary Medicine Major	10
Veterinary Technician Major	3

Pre-Veterinary Student Peer Advisors

Spring, 2005
Pam Fry
Alyse Aerts
Lorie Painter

Fall, 2005
Pam Fry
Alyse Aerts
Lorie Painter

Undergraduate Degrees Obtained

May 2005

Name	Major
Angie Andersen	Veterinary Science
Lindsay Bulin	Veterinary Science
Tyson Dinslage	Veterinary Science
Nathan Heidbrink	Veterinary Science
Emily Humphrey	Veterinary Science
Meggan Kroeker	Veterinary Science
Rachel Manske	Veterinary Science
Abby Obermiller	Veterinary Science
Kathleen Sackett	Veterinary Technology
Megan Schmidt	Veterinary Science

August 2005

Name	Major
Jason Pieper	Veterinary Science

December 2005

Name	Major
Lindsay Bulin	Veterinary Science
Holly Samson	Veterinary Science

Nebraska Residents Enrolled in KSU CVM, Academic Year 2005 (5/04-4/05)

Fourth Year Students	Class
Asche, Leslie	2006
Bangert, Alicia	2006
Carpenter (Spurgin) Rebecca	2006
Choma, Kimathi	2006
Crumly, Lindsey	2006
DiMari, Joseph	2006
Ditmars, Nora	2006
Hartmann, Erica	2006
Jones, Stephanie	2006
Kaliff, Melody	2006
Karlin, Wm. Mike	2006
Longfellow, Daniel	2006
Rath, Fatima	2006
Rowan, Jennifer	2006
Skavdahl, Elizabeth	2006
Smith, Eliza	2006
Stahl, Matthew	2006
Stuart, Jeremy	2006
Sund, Patricia	2006
Tolstedt, Calvin	2006
Tuller, Eric	2006
Jeremy Young	2006

Third Year Students	Class
Backlund, Michelle	2007
Becher, Megan	2007
Bessmer, Aaron	2007
Bockelman, Toni	2007
Buschkamp, Nicholas	2007
Cole, Jeremiah	2007
Creighton, Amanda	2007
Fellers, Kristen	2007
Friedericks, Marc W.	2007

Third Year Students (con't)	Class
Grosse, Miranda	2007
Heftie, David	2007
Jirovsky, Lynn	2007
Knisley, Cody	2007
Larson, Aaron	2007
Leach, Tiffany	2007
Nienhueser, Travis	2007
Olson, Emily	2007
Rainwater, Kimberly	2007
Schmid, Luke	2007
Stevens, Lindsey	2007
Stones, Allen	2007
Svehla, Nichole	2007
Thiel, Kevin	
Thomassen, Michael	2007
Tolstedt, Calvin	2007
Torpy, Rebecca	2007
Willers, Amanda	2007

Second Year Students	Class
Abel, Jeramie	2008
Bottger, Jeffrey	2008
Eitzmann, Allison	2008
England, Shauna	2008
Friedel, Christopher	2008
Haase, Melissa	2008
Holt, Kristina	2008
Kilburn, Jennifer	2008
Kilzer, Elizabeth	2008
Koppold, Emily	2008
Korus, Jeffrey	2008
Kruce, Rachel	2008
Lustgarten, Meghann	2008

Second Year Students (con't)	Class
Moravec, Martin	2008
Pigsley, Becky	2008
Robbins, Joel	2008
Schumacher, Stephen	2008
Staab, Dusty	2008
Stevens, Elliot	2008
Straka, Lindsey	2008
Talbott, Joan	2008
Waechter-Mead, Lindsay	2008
Wood, Jamie	2008
Wright, Leann	2008

First Year Students	Class
Fear, Clarence	2009
Flock, Katie	2009
Crystal Frost Rhine	2009
Corinna Gibbons	2009
Nathan Kotschwar	2009
Alicia Lloyd	2009
Shauna Malchow	2009
Brooke Martin	2009
Mathew McGraw	2009
Todd Mitchell	2009
Brian Stones	2009

Nebraska Residents That Graduated from Kansas State University May, 2005	
Brandt, Aric	Keiser, Sarah
Branek, Belinda	Knobbe, Marc
Brester, Jill	Knope, Jennifer
Butterfield, DaLean	Lee, David
Chytka, Brandi	Livengood, Mary
Ellis, Daniel	Luebbe, Bradley
Emmanuel. Sara	McGreer (Whitworth), Brandy
Fleischacker, Rachel	Mohr, Catherine
Gdanitz, Justin	Panko, Lee
Gladney, Jason	Patera, Kimberly
Hauser, Donovan	Pohlman (McFee) Renee
Hruby, Jennifer	Strongin, Sara
Irwin, Katherine	Suda, Shelli
Johnson, Brad	Tebay, Cory
Jordan, Will	

UNL STUDENTS ATTENDING OTHER VETERINARY COLLEGES OTHER THAN KANSAS STATE UNIVERSITY OR IOWA STATE

Name	Pre-Vet Curriculum Completed	Admitted to
Nathan Heidbrink	5/2005	Ohio State
Abby Obermiller	5/2005	Texas A&M

Nebraska Residents Attending Iowa State University

First Year Students	Class		
Assad, Katherine M	2009	Waples, Alison J	2009
Bierman, Merle J	2009	Whitted, Alexis L.	2009
Deroin, Jamie L.	2009	Woolard, Rebecca L.	2009
Dinslage Tyson G.	2009		
Friedrich, Rachel A.	2009		
Gulbrandson, Cody M.	2009		
Jensen, Justin V.	2009		
Kahle, Kelsey L.	2009		
Kopf, Kelli M.	2009		
Kreifels, Tammy L.	2009		
Meyer, Ashley E.	2009		
Perez, Margarita M	2009		
Petersen, George F.	2009		
Pieper, Jason B.	2009		
Reiman, Amber N.	2009		
Reiter, Dawn M	2009		
Schaefer, Jennifer L	2009		
Schmidt, Megan E.	2009		
Shemek, Angela K.	2009		
Shultz, Mikaleh A.	2009		
Smith, Rik R.	2009		
Thiele, Melissa A.	2009		

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
PHD & MS GRADUATE STUDENTS

MS Candidate /Advisor	Program	Title Research Project
William Brockway BS, DVM, University of Minnesota (Dickey D. Griffin)	MS	Pleural strip lesions at slaughter and pneumonia in cattle
Harpreet Chahal BVSc., Punjab Ag University, India (Raúl G. Barletta)	MS	Alanine metabolism in mycobacteria
Ching Hsin Hsu BS, China (Fernando A. Osorio)	MS	Protective immunity to PRRSV
Rolland Kramer BS, DVM, UNL, Ohio State University (Gary P. Rupp)	MS	Evaluation of ultrasound to determine Intramuscular fat at re-implant time and at Pre-harvest in beef cattle
Namal Liyanage BA, University of Sri Lanka (Marjorie F. Lou)	MS	Oxidation damage repair enzymes: Thioredoxin And its regulation in the lens epithelial cells
Yuko Mori BS, University of Nebraska-Lincoln (Clayton L. Kelling)	MS	TBA
Marilia Oliveira DVM, Brazil (Fernando A. Osorio)	MS	Evaluation of immunogenic subunits of PRRSV using viral vectors

PhD Candidate/Advisor	Program	Title Research Project
Gustavo Bretschneider DVM, University of Nacional de Buenos Aires MS, National Univ of Mar Del Plata, Argentina (Rodney A. Moxley)	PhD	Immune responses to *Escherichia coli* O157:H7 in cattle and role in protection
Kate Chen BA, MS, China (Marjorie Lou)	PhD (BioChem)	Investigating the initial sites of redox signaling in human lens epithelial cells
Rohana Dassanayake DVM, University of Peradeniya, India, MS, UNL (Gerald E. Duhamel)	PhD	Mechanism of *Brachyspira pilosicoli* trafficking Inside macrophage
Harshdeep Dogra BVSc, PAU Ludhiana, India MVSc, CSKHPKV, Palampur, India (Raúl G. Barletta)	PhD	TBA
Joseph Erume DVM, Makerere University, Uganda MS, University of London (Rodney A. Moxley)	PhD	Influence of enterotoxins and capsule on colonization of the porcine intestine by enterotoxigenic *escherichia coli*
Vicki Geiser BS, MS, University of Nebraska-Lincoln (Clinton J. Jones)	PhD (BioSci)	Regulation of productive infection by the bovine herpesvirus 1 encoded bICPO

PhD Candidate/Advisor	Program	Title Research Project
Jamie Henningson BS, DVM, Kansas State University (David J. Steffen)	PhD	Chracterization of comparative virulence of non-cytopathic variants of NADL bovine viral diarrhea virus with mutation in non-structural protein NS4B or Npro by experimental inoculation of calves
Manirath Khounlotham BSc, University Montpellier II, France MSc, University of Paul Sabatier-Toulouse II, France (Jeff Cirillo)	PhD	Molecular Analysis of Mycobacteria pathogenesis
Byung Kwon DVM, MS-Kon Kuk University Seoul, Korea (Fernando A. Osorio)	PhD	Immunopathogenesis of porcine reproductive respiratory syndrome virus
Florencia Meyer BS, MS, Uruguay, Texas Tech (Clinton J. Jones)	PhD (BioSci)	Functional analysis of the bovine herpesvirus 1 (BHV-1) latency related gene
Dhammika Navarathne BVSc, University of Peradeniya Sri Lanka (Gerald E. Duhamel)	PhD	Role of farnesol in the pathogenesis of Disseminated *Candida albicans* infection
Debasis Nayak BVSc, Orissa Veterinary College, India MVSc, Maras Veterinary College, India (Asit K. Pattanik)	PhD	Porcine reproductive and respiratory Syndrome virus replication and pathogenesis
Sandra Perez DVM-Faculty of Vet Science, Argentina MS-Faculty of Agrarian Science, Argentina (Clinton J. Jones)	PhD	Bovine herpesvirus-1 induced pathogenesis
Kazima Saira BS, MS, India (Clinton J. Jones)	PhD	Regulation of interferon production by Alpha-herpesviruses
Yin Wang BS, MS, Taiwain (Marjorie F. Lou)	PhD (BioChem)	Signal transduction: The mechanism for ROS generation in lens epithelial cells
Yefei Zhu MEDI, MSVc., Zhejiang Med Univ, India (Greg A. Somerville)	PhD	Exploiting staphylococcal metabolism to prevent biofilm associated heart infections

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
2005 GRADUATE DEGREES OBTAINED

MS Degrees

May

Harpreet Kaur Chahal — "Role of L-Alanine Dehydrogenase and D-Alanine Racemase of Mycobacteria in D-Alanine Metabolism"
Advisor: Dr. Raúl G. Barletta

December

William Brockway — Non-Thesis
Advisor: Dr. Dickey D. Griffin

Namal P.M. Liyanage — "Thioredoxin and its Regulation by Thioredoxin Binding Protein-2 in the Lens"
(Advisor: Dr. Marjorie F. Lou)

Paul Nabity — "Genetic Variability of *Moraxella bovis* and *Moraxella ovis* Field isolates"
Advisor: Dr. Douglas G. Rogers

PhD Degrees

August

Rohana Dassanayke — "Comparative Structure Function Analysis of Enteric Campylobacter and Helicobacter Species Cytolethal Distending Toxins"
Advisor: Dr. Gerald E. Duhamel

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES SEMINAR SERIES, 2005

VBMS 909 Seminars
Spring Semester, 2005

January 10	"Dissecting Bacterial Respiratory Pathogens" Jeffrey Cirillo, Associate Professor, University of Nebraska-Lincoln
January 31	"Quantitative Epidemiology in FSIS: Examples From A Food Safety Fellow's Perspective" Alecia Larew-Naugles, USDA, Washington, DC
February 7	"Mycobacterial Pathogenesis: Lessons From *Mycobacterium marinum* and *Mycobacterium leprae*" Lucia Barker, Assistant Professor University of Minnesota, Duluth, Minnesota
February 14	"The ecophysiology of Plant Biomass Degradation In Herbiovores: New Insights Through Genomics and Related Analyses" Mark Morrison, Associate Professor, Ohio State University, Columbus, Ohio
February 21	"Role of Bacterial and Host Immune Factors in the Development of *Escherichia coli* Attaching and Effacing Lesions in Weaned Pigs and Septicemia in Chickens" John Fairbrother, Professor, University of Montreal, Canada
March 7	"Cdk5 Regulates Cell Adhesion and Migration in the Lens and Cornea" Peggy Zelenka, PhD, Head National Eye Institute, Bethesda, Maryland
March 21	"GeneChips- Uses in Studying *Stephylococcus aureus* Pathogenesis" Paul Dunman, Assistant Professor, University of Nebraska Medical Center, Omaha, Nebraska
March 28	"The Cytoletal Distending Toxin B Subunit of *Helicobacter hepaticus* is a Nuclear Localizing Ca^{2+} -and Mg^{2+} -Dependent Endonuclease" Rohana Dassanayake, PhD Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln
April 4	"Analysis of Alpha-herpesvirus Genes Expressed During Latency" Clinton Jones, Professor, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln
April 11	"Challenges and Prospects for Pre-harvest Intervention Strategies of *Escherichia coli* O157:H7 in Cattle" Rodney Moxley, Professor and Interim Department Head, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln
April 18	"Colonic Spirochetosis of Humans and Animals: A Polymicrobial Infection by Multiple Species of *Brachyspira* and *Helicobacter*" Gerald Duhamel, Professor, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln
April 25	"Tick-borne Relapsing Fever: From Dr. Livingstone to Montana" Tom Schwan, Acting Chief and Senior Investigator, Laboratory of Human Bacterial Pathogenesis, Hamilton, Montana

VBMS 909 Seminar
Fall Semester, 2005

August 22	"Role of Attaching and Effacing (A/E) Proteins in *Escherichia coli* O157:H7 Intestinal Colonization of Adult Cattle" Gustavo Bretschneider, PhD Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

VBMS 909 Seminar
Fall Semester, 2005

August 29 — "Disruptaion of enterotoxin genes of enterotoxigenic *E. coli* by allelic exchange using λ Red-mediated recombineering"
Joseph Erume, PhD Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

September 12 — "Characterization of virulence genes of a positive single stranded RNA virus (porcine reproductive and respiratory syndrome virus) sing a reverse genetics approach"
Byungjoon Kwon, PhD Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

September 19 — "Ultraviolet radiation effects on the eye"
Stefan Lofgren, MD, PhD, Visiting Post Doctoral Fellow

September 26 — "Mapping virulence-associated regulatory networks in the flesh-eating bacterium Streoptococcus pyogenes"
Dr. Michael Chaussee, Assistant Professor, University of South Dakota, Vermillion, South Dakota

October 3 — "Host-pathogen interactions during mycobacterial infections"
Manirath Khounlotham, PhD Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

October 24 — "Bovine herpesvirus neuropathogensis and neuronal transport studies"
Dr. Shafiqul Chowdhury, Professor of Molecular Virology, Diagnostic Medicine/Pathobiology, Kansas State University, Manhattan, Kansas

November 7 — "Characterization and immunogenicity of recombinant vesicular stomatitis virus as a viral vector expressing GP5 and M protein of porcine reproductive respiratory syndrome virus"
Marilia Oliveira, MS Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

November 14 — "Genomic and post-genomic approaches to studying mycobacterium tuberculosis pathogenicity"
Dr. Issar Smith, Member, TB Center, The Public Health Research Institute, Newark, New Jersey

November 21 — "Recruitment, retention and practice characteristics of Nebraska veterinarians"
Dr. John Schmitz, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

November 28 — "Comparative structure and function analysis of enteric campylobacter and helicobacter species cytolethal distending toxins"
Rohana Dassanayake, PhD Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

Special Departmental Seminars

February 28 — "Studies on Viral Gene Expression and Vaccine Design Using Negative-Strand RNA Viruses"
Sabash Das, Candidate for Research Assistant Professor in the Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

December 8 — "Vaccines for Streptococcal Mastitis – molecular disappointment with philosophical satisfaction"
Dr. David McVey, Candidate for Veterinary Diagnostic Microbiologist in the Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln

US Meat Animal Research Center In-House Seminars
Clay Center, Nebraska

February 18	"Cattle Germplasm Evaluation and Genetics Research" Larry Cundiff
March 4	"Selection for Calving Ease and Plans for Marker Assisted Selection in Cattle" Gary Bennett
March 18	"Genetics and Genomics Research in Sheep" Kreg Keymaster
April 1	"Meats Research at MARC" Tommy Wheeler
April 5	"Effects of Fetal Number and Position on Fetal Development in Cattle" Dr. Sherrill Echternkamp
April 12	"Efficiency of Sprerm Production in Boars" Dr. Joe Ford
April 15	"Selection for Multiple Births in Cattle" Sherrill Echternkamp
April 29	Tim Smith. "Cattle Genomics Research"
May 6	"Bioinformatics Research" John Keele
May 20	"DECI" Tom Jenkins and Charles Williams
June 3	"Nutrition Research at MARC" Cal Ferrell
June 17	"Swine Genomics Research" Brad Freking and Dan Nonneman
September 2	"Swine Genomics Research at MARC Gary Rohrer
September 30	"Swine Nutrition Research" John Klindt
October 7	"Animal Stress Research" Jack Nienaber
October 12	"Preimplantation Embryonic and Placental Development in Livestock" Dr. Jeremy Miles
October 14	"Viability of *Escherichia coli* O157:H7 in feces collected from finishing steers" Dr. Jim Wells
October 21	"Animal Waste Research" Vince Varel and Jack Nienaber
November 4	"Swine Reproduction Research" Joe Ford and Jeff Vallet
November 18	"State of MARC" Dr. Mohammad Koohmaraie

UNIVERSITY OF NEBRASKA
GREAT PLANS VETERINARY EDUCATIONAL CENTER
TEACHING, 2005

Faculty –

Gary P. Rupp, DVM, MS, Dip. ACT
D. Dee Griffin, DVM, MS
Roger W. Ellis[2], BS, DVM, MS

Staff –

Romona Dana
Debbie George
Steve Johnson
Karen Shuck

Graduate Students –

Jeff Ondrak, BS, DVM - MS Student
Thomas Reece, BS, DVM - MS Student

The general direction of the GPVEC in 2005 saw changes with a new agreement with Iowa State University (ISU) College of Veterinary Medicine. Although the major emphasis of the teaching program will be similar, the opportunity to enhance the teaching program and expand the training of professional students is a major part of planning. The final class of Nebraska veterinary students attending KSU will graduate in the spring of 2008 and students from KSU will attend electives through that time.

Some of the activities during the year included an AVMA Accreditation Site Visit at UNL and some of the members came to GPVEC to tour the facilities and become acquainted with the general training programs and meet with the faculty. Dean John Thompson, Associate Dean Don Draper and several other ISU faculty were in attendance with the group. We also had a visit from the New President of the University of Nebraska, Dr. James Milliken who was hosted by Vice Chancellor Owens and Assistant Vice Chancellor Allan Moeller.

An excellent group of veterinarians representing the eighth Beef Cattle Production Management Series (BCPMS) completed the last module in February and several participants plan to continue to work toward a distance masters degree program. As in the past, the BCPMS has been a very active group of practitioners and the number completing the requirements for certification was again very high. Participants represented nine states including: Nebraska, Kansas, Oklahoma, Texas, California, Connecticut, Missouri, Minnesota, and Florida.

The shortage of food animal veterinarians and graduates desiring rural practices is being addressed by a relatively new group known as the Academy of Rural Veterinarians (ARV). This group was formed by members of previous BCPMS marketing groups. The group of practitioners conceived the idea and have been instrumental in bringing it into existence nationally. This innovative group are positive forces in encouraging new graduates to consider rural practice following graduation. Their members have given presentations to students at the majority of veterinary colleges nationally. In cooperation with the ARV University of Nebraska GPVEC and KSU faculty were able to obtain a special CSREES Grant entitled "Stimulating the Development of Veterinarians to Serve Rural America and have determined guidelines to fund students in externships with ARV members and visit more veterinary colleges.

In addition to the regular student electives offered at GPVEC a group of ISU and Mississippi State University students completed a week long course, Exploration of Food Animal Production. Another group from the same colleges of veterinary medicine attended an advanced Beef Production course for a week in

November. It is anticipated that these groups will return twice each year during spring and fall semesters.

The cooperative program between the University of Nebraska and the U.S. Meat Animal Research Center (USMARC) continues to provide veterinary service for livestock while training veterinary students in clinical aspects of animal health. The GPVEC faculty and staff have also maintained hands on training activities with the Nebraska College of Technical Agriculture to provide hands-on activities for their veterinary technician students. A calving and lambing rotation was available over three weekends for interested students. In addition, one veterinary technician student completed an eight week externship with the GPVEC technician this spring.

RESEARCH

A new grant is being planned to develop a multi-state project aimed at the validation of pooled BVDV testing for herd status and moving toward controlling BVD in beef cattle herds. The grant project will be submitted in conjunction with Colorado, Iowa, Kansas, Missouri, and Nebraska veterinary scientists and the respective diagnostic laboratories. Although the prevalence of BVD in beef cattle herds appears to be relatively low, it is a constantly recurring problem with the sale and movement of PI animals (especially calves) that infect new herds. The possible development of pooled testing should encourage better disease surveillance in a larger number of beef herds and eventually reduce the number of infected calves reaching feedlots.

The project in conjunction with the GPE study at the USMARC involving observation of bulls in the Cycle 8 study will be nearly completed except for the parentage identification of offspring. This experimental project has been the major study for Dr. Roger Ellis in completing his M.S. Degree. He has finished a paper and will present it at the Society for Theriogenology Meeting and it will be published in Theriogenology Journal.

Dr. Griffin will complete data collection on his PHAST project this summer on a group of heifers. The Biosecurity Grant will be extended one final year in order to complete a survey of veterinarians and producers in the three states involved.

EXTENSION

Extension continues to be an important component of the GPVEC effort. Dr. Griffin has been very active in presenting a large number of programs across the state to livestock producers and has been a major leader in the BQA effort nationally. He continues to be a major resource for cattle feeders and veterinarians in Nebraska and has a national presence in working closely with other extension specialists.

The Higher Education training grant involving biosecurity on farms and ranches continues to support a number of programs for producers and veterinarians in the effort to reduce infectious disease exposure to livestock. Several presentations have been given by faculty members from GPVEC and many producers are becoming keenly interested in prevention of costly diseases in their herds.

The CowCalf5 Herd Records and Analysis Program is still being supported and because of the National Identification Program has gained prominence because of its versatility with many different EID systems. Steve Johnson is the primary support person and handles all updates and the help line. He has cooperated with all major EID companies and has made the program compatible with each of them. He has also been an excellent resource for cattlemen and veterinarians wanting CE and updates and has presented a large number of meetings statewide and to other states.

PUBLICATIONS

Ellis RW, Rupp GP, Chenoweth PJ, Cundiff LV and Lunstra DD. 2005. Fertility of yearling bulls during mating. Journal of Theriogenology, 64:657-678

Sanderson, MW, JM Sargeant, DG Renter, DD Griffin and RA Smith. 2005. Factors Associated with the Presence of Coliforms in the Feed and Water of Feedlot Cattle. Applied and Environmental Microbiology, 71(10):6025-6032

Table 1. Enrollments in Student Electives, 2005-2006

Elective	Number Enrolled*	Universities represented (number of students)
Bovine Reproduction	9	Kansas State University (9)
Bull Breeding Soundness	5	Kansas State University (5)
Calving	14	Kansas State University (14)
Clinical / Calving	12	Kansas State University (12)
Feedlot Production Management and Health Consulting	17	Kansas State University (9) Iowa State University (3) Michigan State University (4) Virginia-Maryland Regional College (1)
Pregnancy Examination	12	Kansas State University (12)
Exploration of Food Animal Production†	102	Kansas State University (102)
Lambing	5	Kansas State University (5)
VDPAM483 Beef Production	22	Iowa State University (17) Mississippi State University (5)
Total Enrollment	198	

* The College of Veterinary Medicine (CVM) at Kansas State University (KSU) operates on a May-to-May academic Year, thus enrollment figures are reported for May 2005-May 2006.

† Required rotation for KSU Sophomores

Table 2. GPVEC Student Electives, 2005-2006

(All student electives are one week in length)

Electives	Offered	Date
Clinical Practicum	32 weeks	Available Upon Request
Bovine Reproduction	1 week	November
Bull Breeding Soundness	1 week	April
Calving	4 weeks	March
Clinical/Calving	4 weeks	March, April
Feedlot Management and Consulting	5 weeks	October, February
Pregnancy Examination	3 weeks	October
Exploration of Food Animal Production	4 weeks	May, August
Lambing	5 weeks	January, February, March,
Special Studies		Available Upon Request

Table 3. GPVEC Continuing Education Seminars 2005

CowCalf5 Herd Health Record System Software

Seminar Dates	No. of Participants
February 28, 2005	7
June 23-24, 2005	9

Table 4. Beef Cattle Production Management Series VIII (2004-2005)

Course Topics

Cow/Calf Records Systems
- CowCalf5 Production/Performance
- Risk Management
- Cow Efficiency

Decision Evaluator for the Cattle Industry (DECI)

Financial
- Economics/Finance/Accounting
- Standardized Performance Analysis (SPA)
- Introduction to Tax Forms

Computer Training
- File Management
- Internet Useage
- Windows Operating System
- MS Office/PowerPoint/ Excel/ Word

Epidemiology and Scientific Literacy
- Epi-Info
- Measuring Production and Disease
- Disease Outbreak
- Diagnostic Testing
- Risk Factor Analysis

Critical Evaluation of Vet Literature
- Information Retrieval

Biostatistics
- Analysis of Variance
- Descriptive Statistics
- Inferential Statistics

Clinical Trial Designs

Feedlot
- Feedlot Production
- Futures Marketing
- Total Quality Management and Design
- Feedlot Management and Design
- Predicting Performance
- Intro to Feedlot Environmental Control
- Feedlot Break-evens
- Implant Strategies
- Monitoring of Packing House

Personal Development
- Communications Skills
- Meyers-Briggs Test

Nutrition
- Range Cow Nutrition/Management
- Beef Cattle Protein Requirements/Feedstuffs
- Evaluating Forage Quality
- Basic Ration Formulation
- Replacement Heifer Nutrition
- NRC-Nutrient Requirements and Rations
- By-Products Feeds and Feed Additives
- Stocker Nutrition/Management
- Vitamins/Minerals/Feed Additives
- Nutritional Considerations for Improving Efficiency
- Feed Delivery Management

Biotechnology
- Integrating Biotechnology into Beef Production
- Bovine Genomics
- Biotechnological Advances in Veterinary Diagnostics and Pharmaceutics
- Food Animal Transgenics and Cloning

Beef Cattle Breeding
- Breed Differences
- Crossbreeding and Composites
- Bull Selection
- Value of Live and Carcass Traits of Cattle
- Profitable Bull Selection
- Important Concepts of Beef Cattle Selection
- Evaluation of Maternal, Growth, and Carcass Characteristics of Diverse Breeds
- Use of Heterosis and Breed Differences in Crossbreeding and Composite Breeds
- Selection for Calving Ease

Table 5. Beef Cattle Production Management Series - Participants

Series VIII, 2004 - 2005
(June 2004 - February 2005)

1.	John Boucher	Dodge, Nebraska
2.	Judy Bowmaster	Curtis, Nebraska
3.	Bud Dinges	Richmond, Texas
4.	Roger Ellis	Clay Center, Nebraska
5.	Edgar Garrett	Manhattan, Kansas
6.	John Gilliam	Stillwater, Oklahoma
7.	John Groves	Eldon, Missouri
8.	Scott Haskell	Chicago Park, California
9.	Dennis Hermesch	Plymouth, Nebraska
10.	Max Irsik	Gainesville, Florida
11.	Rolland Kramer	Stapleton, Nebraska
12.	Frederico Moreira	Waterford, Connecticut
13.	Randall Norton	Utica, Kansas
14.	Jeff Ondrak	Fairbury, Nebraska
15.	Craig Payne	Sedalia, Missouri
16.	Paul Ritter	Oakley, Kansas
17.	Joe Roder	Canyon, Texas
18.	John Rodgers	Fairmont, Minnesota
19.	Brian Spitzer	Pratt, Kansas
20.	Travis Van Anne	Gering, Nebraska

Nebraska	7
Kansas	4
Missouri	2
Oklahoma	1
Texas	2
California	1
Connecticut	1
Minnesota	1
Florida	1

Table 6. Beef Cattle Production Management Series - Mentors

Series VIII, 2004 - 2005
(June 2004 - February 2005)

Peter Chenoweth, BVSc, PhD
Professor
Kansas State University

Marilyn Corbin, DVM, MS, PhD
Feedlot Consultant
Oakland, Nebraska

Terry DeGroff, DVM
Adjunct Professor & Private Practitioner
Burwell, Nebraska

Galen Erickson, MS, PhD
Assistant Professor
University of Nebraska - Lincoln

Dee Griffin, DVM, MS
Professor
University of Nebraska - GPVEC

Jim Gosey, MS, PhD
Professor
University of Nebraska-Lincoln

Eddie Hamilton, DVM, MAgr
Associate Professor
South Dakota State University

Tom Jenkins, MS, PhD
Research Animal Scientist
U.S. Meat Animal Research Center

Steve Johnson, BA
Computer Systems Manager/Analyst
University of Nebraska - GPVEC

Jim Keen, DVM, PhD
Veterinary Medical Officer
U.S. Meat Animal Research Center

Bob Larson, DVM, PhD
Assistant Professor
University of Missouri

Jim McGrann, DVM, MS
Extension Beef Economist
Texas A&M University

Gary Rupp, DVM, MS, ACT Dipl.
Professor and Director
University of Nebraska - GPVEC

Mike Sanderson, DVM, MS
Associate Professor
Kansas State University

Gary Sherman, MS, DVM, PhD
Staff Fellow
U.S. Food & Drug Administration

David Smith, DVM, PhD
Associate Professor
University of Nebraska-Lincoln

John Spitzer, MS, PhD
Professor
Clemson University

Table 7. Beef Cattle Production Management Series - Guest Speakers

Series VIII, 2004 - 2005
(June 2004 - February 2005)

Sarah Foglemen
Extension Agricultural Economist
Kansas State University

Janice Swanson, PhD
Professor
Kansas State University

Gary Bredensteiner, MS
Emeritus Extension Educator
University of Nebraska

Jim Kennedy, DVM, MS
Head
Rocky Ford Diagnostic Lab

Brett Andrews, DVM
Burwell Veterinary Hospital

Mark Thallman, MS, PhD
U.S. Meat Animal Research Center

Don Adams, MS, PhD
Ruminant Nutritionist
University of Nebraska - WCREC

Bob Sorensen, PhD
Agronomist
UNL Emeritus Professor

Lawrence Firkins, DVM, MS, MBA
University of Illinois

Darrell Mark, PhD
Ag Economist
University of Nebraska-Lincoln

Rick Koelsch, PhD
Associate Professor
University of Nebraska-Lincoln

Barry Dunn, PhD
Ag Economist
Texas A&M University

Roger McKeown, LLB, PhD
Iowa State University

Jess Hinrichs, DVM
Sutton Veterinary Clinic

Alan Janzen
Owner and Manager
Circle 5 Feedyard

Larry Cundiff, MS, PhD
Research Leader, Genetics & Breeding
U.S. Meat Animal Research Center

Dale Blasi, PhD
Extension Specialist
Kansas State University

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
2005 RESEARCH PROGRAM

Most all of the department faculty are involved in some research activity, either as a project leader or as a contributor to a research group. Some faculty members have designated appointments in research. As a part of this appointment, they prepare research project descriptions, which are peer-reviewed through a process established by the Agricultural Research Division (ARD) and are assigned ARD research project numbers. Through an extension of the same process, some projects can be approved by the USDA Cooperative State Research Services for matching federal funds, including Hatch, Regional Research or Animal Health Research Formula Funds. As a matter of USDA policy, competitive research grants from the USDA are assigned separate ARD project numbers. Some research projects are assigned ARD numbers for administrative and budget management purposes, even though they are not specifically research projects, e.g., the Research Laboratories and Animal Care Facility (NEB 14-039) and the Nebraska Veterinary Diagnostic Laboratory System project (NEB 14-059). Research projects funded by the University of Nebraska-Lincoln, Center for Biotechnology, or other external sources are not required to go through the required ARD research project review process.

Faculty Research Interests

Barletta, Raúl G.	Molecular genetic bases of bacterial pathogenesis and drug resistance, mycobacterial infections in cattle (Johne's disease) and human beings (tuberculosis, *M. avium* infections)
Brodersen, Bruce W.	Pathogenesis of bovine viral diarrhea virus; diagnostic pathology
Doster, Alan R.	Ultrastructural changes in the lung produced by bacteria, viruses and pneumotoxic compounds
Duhamel, Gerald E.	Pathogenesis of enteric diseases caused by spirochetes and rotavirus; primarily *Brachyspira pilosicoli* and bovine rotavirus
Griffin, D. Dee	Beef cattle production medicine, especially respiratory disease in feedlot cattle
Jones, Clinton J.	Regulation of viral gene expression and persistent herpesvirus infections; mechanisms of chemical and viral carcinogenesis.
Kelling, Clayton L.	Pathogenesis of viral diseases, primarily bovine respiratory syncytial virus and bovine viral diarrhea virus infections

Lou, Marjorie F.	Biochemical mechanism of senile cataract formation: controls of cellular thiol/disulfide homeostasis
Moxley, Rodney A.	Pathogenesis and control of *Escherichia coli* infections in swine and cattle; on-farm control of *E. coli 0157:H7* prevalence in beef cattle (food safety)
Osorio, Fernando A.	Pathogenesis of persistent viral infections including persistent reproductive and respiratory syndrome (PRRS) virus and herpesvirus latency; vesicular diseases
Rogers, Douglas G.	Pathogenesis of chlamydial infections in livestock
Rupp, Gary P.	Effect of production practices and management on beef cattle diseases and enterprise profitability
Smith, David R.	Food safety through study of on-farm prevalence and control of *E. coli 0157:H7* in beef cattle; epidemiologic approaches to study of livestock diseases
Somerville, Greg A.	Metabolic and environmental regulation of staphylococcal pathogenesis. Redox-dependent regulation of virulence factor synthesis
Steffen, David J.	Diagnosis and characterization of genetic and congenital diseases of cattle

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
AGRICULTURAL RESEARCH DIVISION RESEARCH PROJECTS

ARD Project #	Project Title and information	Expiration Date
14-039	(0096920):SAES/NEB/STATE HATCH PROJECT: Research Laboratories and Animal Care Facility (DK Hardin)	Indefinite 2020
14-059	(0153376):STATE HATCH PROJECT: Vet Diagnostic Lab System: Diagnostic Surveillance & Disease Investigation in Nebraska Livestock & Poultry (DJ Steffen/AR Doster/RA Moxley)	Indefinite 2020
14-115	(0187737):CSREES/USDA/NRB (Hatch Project/NC-229): Porcine Reproductive and Respiratory Syndrome:Mechanisms of Disease and Methods for the Detection, Protection and Elimination of PRRRS Virus (FA Osorio/AK Pattnaik, R Johnson/J Weber)	09/30/2009
14-117	(0189498):CSREES/NEB/NRI Competitive Grant: Role of A/E Proteins in *E. Coli O157:H7* Intestinal Colonization of Adult Cattle (RA Moxley)	Extended 12/31/2005
14-118	(0190103):CSREES/USDA Animal Health: Pathobiology of Porcine Colonic Spirochetosis Caused by Brachyspira Pilosicoli (G. Duhamel)	08/31/2006
14-119	(0190910):CSREES/NEB/NRI Competitive Grant: Functional Genomic Analysis of Bovine Viral Diarrhea (R. Donis/CJ Kelling)	Extended 12/31/2005
14-121	(0192733):CSREES/NEB:NC-107/Hatch Project: Evolving Pathogens, Targeted Sequences, and Strategies for Control of Bovine Respiratory Disease C. Jones/S. Srikumaran)	10/09/2006
14-123	(0192972):CSREES/NEB Develop Pre-Harvest Version of the USDA-FSIS Fast Antibiotic Screening Test and Antibiotic Residue Avoidance Education (D.D. Griffin)	Extended 09/14/2006
14-125	(0005609):CSREES/NEB; Multi-State NC-1007 Hatch) Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety (R. Moxley)	09/30/2007
14-126	(0194929):CSREES/NEB (Animal Health) Pathogenesis of Bovine Viral Diarrhea Virus and Bovine Respiratory Syncytial Virus Infections (CL Kelling)	09/30/2007
14-127	(0196793):SCREES/NEB/NRI Comp Grant Intervention Strategies to Reduce Escherichia Coli O157:H7 in Beef Feedyards (D. Smith)	09/14/2006
14-128	(0198063):CSREES/NEB/NRI Comp Grant Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1 (BHV-1) Latency Related (LR) Gene (C. Jones/A. Doster)	12/14/2006
14-129	(0199138):USDA/CSREES/NEB NRI Competitive Grant: Molecular Analysis of a Mycobacterium Paratuberculosis Colony-Morphology Attenuated Mutant (R.G. Barletta)	Extended 01/31/2007
14-130	(0199447):CSREES/NEB Animal Health; Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1 (BHV-1) Latency Related (LR) Gene (C. Jones)	09/30/2008
14-131	(0199961):SAES/NEB Veterinary Field Disease Research Program (D. Smith)	04/30/2009

ARD Project #	Project Title and information	Expiration Date
14-132	(0200658):CSREES/NEB Hatch Project Examination of Attenuation and Virulence Determinants of Porcine Reproductive and Respiratory Syndrome Virus (A. Pattnaik/F. Osorio)	06/30/2009
14-133	(0200538):CSREES/NEB Analyses of Virulence and Attenuation Determinants of Porcine Reproductive and Respiratory Syndrome Virus Using Reverse Genetics Approach (AK Pattnaik/F. Osorio	08/31/2007
14-134	(0201032):CSREES/NEB Influence of Enterotoxins on Virulence and Colonization of the Porcine Intestine by *Escherichia coli* (R. Moxley)	08/31/2006
14-136	(0204923):HATCH Tricarboxylic Acid Cycle Mediated Regulation of Staphylococcus Aureus Virulence Factors (G. Somerville)	02/28/2010
14-137	(0203810):SAES/NEB Genetic Basis of Resistance to Food-Borne Bacterial Pathogens (G. Duhamel; J. Weber)	06/30/2007
14-138	(0204665):CSREES/NEB/NRI Competitive Grant: Functional Analysis of BICPO, the Major Transcriptional Regulatory Gene of Bovine Herpesvirus 1 (BHV-1) (CJ Jones)	09/14/2008
14-139	(0204702):NEB/CSREES/NRI Competitive Grant: Use of a Green-Fluorescent Protein-Expressing Strain of Porcine Reproductive and Respiratory Syndrome Virus for the Study of PRRSV Pathogene (FA Osorio; AK Pattnaik)	08/31/2006
14-140	(0205221):NEB/CSREES: Stimulating the development of veterinarians to serve rural America (DD Griffin)	09/14/2007

Biochemical Mechanism of cataract formation: Oxidative stress, thiol regulation and cataract models Investigator

Marjorie F. Lou

Our focus on the biochemical mechanism of age-related cataract formation is oxidative stress. We used hydrogen peroxide-induced cataract in organ culture condition as our model to study the progressive changes in morphology and intracellular redox potential in the lens. We demonstrated that lens opacification is associated with the increased protein insolubility and protein aggregation, resulting from lens protein oxidation by oxidative stress. We also showed that the thiol groups in lens proteins are oxidized by forming protein-thiol mixed disulfides (protein thiolation) followed by protein protein disulfide formation, a condition that will lead to lens opacification. We discovered that this deleterious process could be reversed or delayed if cataract formation is at an early stage, such as removal of the oxidant. The most drastic recovery is the reversal of the thiolation of lens proteins. Therefore, we speculate that the lens must possess some repair systems that can protect it against pathological consequences. We have found two of such repair systems, one is the glutathione-dependent thioltransferase system, which is a cytosolic enzyme and can specifically dethiolate protein-s-s-glutathione. The other is the NADPH-dependent thioredoxin system, which in conjunction with thioredoxin reductase and NADPH can reduce protein-protein disulfides. We have cloned the thioltransferase gene and the thioredoxin gene, purified the recombinant enzyme/protein for their respective functional studies. Both enzyme/protein are very resistant to oxidation and have a characteristic, conserved sequence of CXXC at their active sites. Both systems are proven to have the ability to restore the activities/functions of other oxidation-inactivated enzymes/proteins using human lens epithelial cells pretreated with hydrogen peroxide as a model. Furthermore, genes for thioltransferase and thioredoxin have been shown to upregulate under oxidative stress conditions, a phenomenon of adaptive response by the cells to combat the stress.

A secondary function of thioltransferase has been confirmed to be an ascorbate-recycling enzyme, which is able to reduce the oxidized ascorbate, dehydroascorbate, to return to the reduced form of ascorbate. This is extremely important finding, as the lens is rich in ascorbate, which along with vitamin E, contributes to the protection of membrane lipids. Ascorbate is also needed for other metabolic functions of various enzymes. The oxidized ascorbate, if not reduce in time can form glycation products with lens proteins and lead to high molecular weight aggregates. The catalytical function of thioltransferase in recycling ascorbate is first evidence that an enzyme is involved in reducing dehydroascorbate, against the dogma of a nonenzymatic recycling process.

Lastly, the mitochondrial-specific TTase (Grx2), which we co-discovered recently with Dr. Gladyshev of Biochemistry Department, has been shown to present in the mitochondria of human lens epithelial cells. It possesses duel activities of dethiolase and dehydroascorbate reductase, similar to the cytosolic thioltransferase enzyme. We are pursuing the task of proven the physiological function of Grx2 in 2the mitochondria

Research Project Significance/Impacts

Based on our research results, the concept of oxidative stress-induced cellular damage as one of the major factor for cataractogenesis continue to gain momentum and has escalated our scholarly standing in the eye field as well as outside of the lens research. One of such impact is the founding of the Redox Biology Center at UNL upon receiving the NIH award of 10 million dollar for the Cobra grant. My role of being one of the 5 senior advisors may have contributed to the success of the funding. The other impact is our discovery of the involvement of thioltransferase in the recycling of ascorbate. These results when reported at our annual national eye meeting last year, sent shocking wave to those scientists working in this area. A collaboration by the request from one of these scientists resulted in one manuscript just now completed. A third impact is my recognition and honor extended from Oxford University in England as a Leichfield Lecturer (2002-2003), and a subsequent invitation by the editor from the Oxford University to contribute a review article based on my work in this area for the series of Progress of Retina and Eye Diseases

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The role of reactive oxygen species (ROS) in maintaining the health of lens cells: The redox signaling Investigator

Marjorie F. Lou

We have been concentrating in the redox signaling this year after publishing three manuscripts describing the basic signaling pathways in the lens and how diabetic condition can alter the cell signaling. We have been very successful in demonstrating that reactive oxygen species, which may be harmful to the cells/tissues, but at low level (nanomolar range) can be stimulants for various cell functions, including cell proliferation, via signal transduction pathway. It has been discovered and reported in other tissues/cells that certain growth factors such as PDGF, EGF are functional mitogens because they can stimulate ROS generation endogenously upon binding with the receptors on the cell surface. We have demonstrated with confocal microscopy that fluorescein preloaded into live human lens epithelial cells can generate fluorescence upon PDGF stimulation. The generated fluorescence can be quenched by cells preloaded with catalase enzyme or antioxidants, confirming our speculation that the lens cells have an ability to produce ROS in situ. Additionally, we have shown that exogenous hydrogen peroxide can mimic PDGF and produce similar effect, including activation of a battery of cell signaling proteins, followed by gene expression and eventual cell proliferation. We also showed that the lens cells possesses the membrane-bound enzyme NADPH oxidase, which can generate superoxide ion upon stimulation by arachidonic acid or hydrogen peroxide.

Research Project Significance/Impacts

A new physiological function of reactive oxygen species is identified as redox signaling, which is a process to mediate the function of certain growth factors for cell function. This finding has raised tremendous interest in the lens community. We have definitely being regarded as the laboratory working in the leading edge of lens research.

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NEB 14-039

Research Laboratories and Animal Care Facility

Rodney A. Moxley

This past year, the Animal Research Facility (ARF) has provided housing for 2,039 animals, by species as follows: 30 Blue Winged Teal Ducks; 15 goats; 48 cows; 6 Xenopus frogs; 1,404 mice; 441 pigs; 53 dogs; 40 hamsters and 2 rabbits.

The Animal Research Facility replaced, upgraded and purchased new equipment, such as feed storage barrels, transport carts, storage racks and animal restraint devices, including halters and snares. The Animal Research Facility also increased its rodent cages to a capacity of approximately 100% over the previous year by acquiring new rodent cages and supplies. The floors in rooms B-1, B-2, B-3, B-4, B-5 and G-6 were resealed, making them more suitable for housing companion animals and small laboratory animals. Due to the increased use of the surgical suite for companion animal surgeries, the Animal Research Facility acquired a new isoflourane vaporizer, a large number of small animal surgical instruments, such as huck towels, drapes, incubation tubes, rebreather bags and medications suitable for use in small and companion animals.

The Animal Research Facilities completed the caulking around the floors in the surgery preparation room to ensure an adequate seal. The outside (non-brick portion) of the Animal Research Facility was repainted and the lettering on the outside doors was replaced with new stencils.

IMPACT STATEMENT

The Animal Research Facility staff contributed to a variety of research projects on animal diseases at UNL, by supporting many research projects for VBMS faculty members. The ARF staff also supported many investigators in other departments at UNL. The Animal Research Facility staff also supported projects for private industry; thereby, assisting in the development of new commercially available animal health care products. The Animal Research Facility is also providing some temporary housing for research animals from the Dental College while the Dental College animal housing is being upgraded/ renovated. The Animal Research Facility also participates in public relations and educational ventures, including the Nebraska State Fair, Birthing Pavilion.

The Animal Research Facilities completed the caulking around the floors in the surgery preparation room to ensure an adequate seal. The outside (non-brick portion) of the Animal Research Facility was repainted and the lettering on the outside doors was replaced with new stencils.

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NEB 14-059

Veterinary Diagnostic Laboratory System: Diagnostic Surveillance and Disease Investigation in Nebraska Livestock and Poultry

DJ Steffen, BW Brodersen, DG Rogers, AR Doster and FA Osorio

The lab received 15,330 requests for diagnostic assistance from producers. Foreign animal diseases are included in the differentials and excluded based on laboratory examination or clinical data. We assist state health officials with monitoring programs for *M paratuberculosis*, avian influenza, newcastle disease, classical swine fever, CWD and West Nile virus. A serologic survey of West Nile exposure and risk factors in dogs is in progress. Equine serologic response to West Nile was studied and a poster presented with the findings. Testing for BVDV PI status was performed on 178,000 calves. Positive animals are removed from production to prevent spread of virus. This is the third year of the CWD prevalence study in Nebraska and results should be summarized for publication next year. We continued to support a study of Johnes prevalence in Nebraska as a representation of prevalence in extensive beef cattle operation of the Great Plains and the monitoring program to reduce the incidence of Johnes disease. We investigated the prevalence or Neospora caninum in Nebraska deer and demonstrated that a deer coyote cycle may

exist with infection occasionally spilling into beef cattle populations. Prevalence in deer was estimated at 2-5%. Outbreaks of abortion related to Neosporosis were investigated and one herd with vaccine failure was investigated to characterize risk factors that may have contributed to the increased abortion in the face of vaccination. Dwarfism investigations continued and DNA samples were shared with ISU for genetic analysis. A putative site was found on chromosome 6 associated with the trait. A detailed investigation of Kochia and Rumex intoxication provided data on outcomes that will be useful to educate producers faced with similar exposure issues. Investigations into deaths of wildlife and zoo animals led to recognition of Tsukamurekka Pulmonis as a new differential for granulomatous disease in zoo mammals. Health, reproductive status, and agricultural chemical exposure were accessed in river otters.

IMPACT STATEMENT

BVDV infections rate at 1% means over 1,700 persistently infected calves, the reservoir for virus were eliminated from production facilities. West Nile testing supported state wide monitoring and control programs and significant decreases in animal and human infections were reported in 2003. Studies in horses demonstrated the reduced utility of IgM serology in endemic regions. It appears IgM response is muted in clinical infections from vaccinated and previously exposed animals. Routine surveillance testing supports free movement of livestock products across state and national boundaries and identifies endemic diseases providing useful data for management and treatment of diseases that affect livestock profitability. The CWD and Johnes surveys will provide base line statistically valid prevalence data for the state so that effectiveness of intervention can be measured. Identification of and publications describing, emerging diseases of domestic and wild animals aids those responsible for animal health in humane management of those resources.

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NEB 14-115

Porcine Reproductive and Respiratory Syndrome (PRRRS)

F.A. Osorio

Using reverse genetics, we generated a series of chimeric viruses containing specific genomic sequences of an attenuated PRRSV vaccine strain (Prime Pac) within the genomic context of a highly virulent infectious clone (FL-12). Eight viable chimeric viruses, encompassing the entire genome of PRRSV (Prime Pac), have been obtained. Five of these chimeras include all the non-structural open reading frames (ORFs): Most virulence determinants clustered in the structural genes of PRRSV. Some non-structural regions of the PRRSV genome (NSP3-8) exhibited a marked role in virulence. Meanwhile, other non-structural regions (NSP1-3, NSP10-12) showed an intermediate attenuation phenotype, while other non-structural (NSP9) or structural (ORF2) regions of the PRRSV genome could be ruled out as important determinants of virulence. We further dissected the structural regions for a finer mapping of individual ORFs of the PRRSV genome and generated 5 more chimeric viruses representing the majority of each individual ORF, 3 through 7.

Three putative N-linked glycosylation sites (N34, N44, and N51) are located on the GP5 ectodomain, where a major neutralization epitope also exists. To determine which of these putative glycosylation sites are used in PRRSV life cycle and the role of the glycan moieties in induction of neutralizing antibodies, we generated a panel of GP5 mutants containing single and multiple amino acid substitutions at these sites. In serum neutralization assays, the mutant viruses exhibited enhanced sensitivity to neutralization by wt PRRSV-specific antibodies. Furthermore, inoculation of pigs with the mutant viruses induced significantly higher levels of neutralizing antibodies against the mutant as well as the wt PRRSV, thus suggesting that the loss of glycan residues in the ectodomain of GP5 enhances both the sensitivity of these viruses to in vitro neutralization as well as the immunogenicity of the nearby neutralization epitope. These results should have great significance for development of PRRSV vaccines of enhanced protective efficacy.

This study is aimed at identifying PRRSV B-cell linear epitopes that would be consistently recognized by the humoral immune response of naturally infected animals. To this end, 213 overlapping 15-mer synthetic peptides covering the whole amino acid sequence of a non-structural protein (nsp2) and all the structural proteins of a North American strain of PRRSV (NVSL97-7895) were used in a peptide-based enzyme-linked immunosorbent assay.

Interestingly, the Nsp2 was found to contain most linear epitopes when compared to the structural proteins. Analysis of the peptides spanning the amino acid sequence of all structural proteins of the NVSL97-7895 strain against convalescent sera (45dpi) revealed the presence of B-cell linear epitopes in all studied proteins. Despite a genetic diversity between different PRRSV genotypes (1), we found immunodominant epitopes in specific regions of the gp2, gp3, gp5 and M protein which has been previously demonstrated to be recognized by immune sera raised against an European strain of PRRSV.

IMPACT STATEMENT

The experiments dealing with reverse genetics using an infectious cDNA clone are significant to understand the virulence of PRRSv and its attenuation. Understanding the gene basis for the virulent phenotype of PRRSV is the basis for the development of new, safer, more rationally designed replicating vaccines. In addition, the identification of epitopes (small fragments) of PRRSV proteins that can be inactivated or eliminated from a live PRRSv may be the basis for the development of a marker vaccine. Along the same line, enhancement of the PRRSV-neutralizing antibody response by molecular modification of the PRRSV proteins is of high value for the development of more effective vaccines against PRRSv infections.

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NEB 14-117

Role of A.E Proteins in *E. Coli* O157:H7 Intestinal Colonization of Adult Cattle

R. A. Moxley

Escherichia coli O157:H7 is an important zoonotic pathogen, and prevention of infection in cattle has been proposed to reduce the risk of human disease. The outer membrane protein, intimin has been reported to enhance intestinal colonization of adult cattle; however, the importance of Tir (translocated intimin receptor) in this regard has not been addressed. Adult beef cattle (n=30, average age, 16 mo) were orally inoculated with one of 5 isogenic strains of *E. coli O157:H7*, including: (1) tir gene deletion mutant; (2) complemented mutant; (3) tir gene deletion mutant transformed with empty vector; (4) nalidixic acid resistant (NalR) parent; and (5) wild-type (WT). Prior to the first inoculation (C1), all cattle were seropositive by ELISA for antibodies to intimin, Tir, EspA, EspB and O157 LPS. Forty-two days after the first inoculation (42 DPC1), all animals were re-challenged (C2) with the NalR parent strain to test whether prior infection with a Tir+ strain had any effect on shedding. At 14 DPC1, the WT strain was shed in the feces at higher levels than the other challenge strains, whereas shedding of the complemented mutant and NalR parent strains was comparable to that of the tir gene deletion mutant strain. No increase in anti-Tir titer was detected following C1 with either the Tir- strains or NalR parent strain. In contrast to those inoculated at C1 with the WT and NalR strains, cattle inoculated with either the tir gene deletion mutant or complemented strains at C1 had an increase in the magnitude and duration of NalR bacterial excretion at 14 DPC2, although the difference was not statistically significant ($P>0.05$). Overall, C1 challenge with WT resulted in higher post-C1 anti-Tir and anti-O157 LPS titers compared to the complemented mutant and NalR parent strains, which resulted in low or no detectable anti-Tir immune response. These results suggest that serologically detectable responses to Tir are associated with the level of intestinal infection; however, more studies will be required to determine the relative importance of Tir for *E. coli O157:H7* colonization of the adult bovine gastrointestinal tract.

IMPACT STATEMENT

The results of this study provide a basis for the development of effective pre-harvest intervention strategies for reduction of the prevalence of *E. coli O157:H7* in feedlot cattle. Reduction of *E. coli O157:H7* in cattle should result in reduced environmental and food-borne contamination with the organism, thereby reducing the incidence of infection in humans.

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NEB 14-118

Pathobiology of Porcine Colonic Spirochetosis Caused by Brachyspira Pilosicoli

G. E. Duhamel

Brachyspira pilosicoli is a major cause of colonic spirochetosis, a polymicrobial inflammatory bowel disease that affects humans and a wide range of animal species. Five penicillin-binding proteins were identified among human and porcine *B. pilosicoli* strains. Cecal spirochetosis and typhlitis associated with *B. pilosicoli* was characterized in 7.5- to 18-week-old commercial turkeys for the first time. *Enterohepatic Helicobacter* species, including the prototype *H. hepaticus*, are emerging causes of intestinal diseases in humans and animals that produce a novel nuclease toxin, known as cytolethal distending toxin (Cdt). A sensitive fluorometric assay was developed to assess the biochemical properties of the CdtB effector subunit. The Ca2+- and Mg2+-dependence and neutral properties of CdtB were similar to mammalian nucleases, but DNA hydrolysis by CdtB was approximately 100-fold less active and was considerably more resistant to inhibition by ZnCl2 and G-actin than mammalian nucleases. Similar to other gram negative pathogens, the CdtB subunit of *H. hepaticus* localized to the nucleus and alone was sufficient for cellular intoxication. Comparative analysis of CdtB genes and toxins produced by *C. jejuni*, a major cause of food-borne diarrheal illnesses, *C. hyointestinalis*, an emerging cause intestinal diseases in pigs and human beings, and *C. coli* commonly found in intestinal specimens obtained from pigs and other species provided new insights into the pathogenesis of intestinal disease associated with these pathogens and methods for improved detection. By contrast with a recent report suggesting high CdtB activity among *C. coli* isolated from pigs in Denmark, CdtB activity was not found among US porcine *C. coli.*

IMPACT STATEMENT

Identification of penicillin-binding proteins of *B. pilosicoli* provides a basis for development of improved control strategies for pathogenic intestinal spirochetes of humans and animals. Cecal spirochetosis caused by *B. pilosicoli* was characterized in commercial turkeys for the first time. Differences between the biochemical properties of Helicobacter CdtB and mammalian nucleases suggest that novel antitoxin control strategies can be developed. A novel Campylobacter cdtB gene encoding a highly toxic CdtB subunit was characterized among porcine and human *C. hyointestinalis*. Porcine *C. coli* are an unlikely source of toxigenic Campylobacter for humans.

NEB 14-119

Functional Genomic Analysis of Bovine Vial Diarrhea

R. O. Donis and C. L. Kelling

Bovine viral diarrhea virus (BVDV), a pestivirus, is a pathogen that is economically important to the cattle industry primarily because of its propensity to cause viremia resulting in fetal infection or immunosuppression. Effective, safe BVDV vaccines that induce protective immunity without causing fetal infection or immunosuppression are needed. Inhibition of cellular innate immunity by pestiviruses correlates with the presence of a nonstructural protein, at the 5 prime terminus of the open reading frame. This N-terminal protein (NPRO) is an autoproteinase. We hypothesized that BVDV virulence also correlates with the presence of NPRO. The objective of the present study was to characterize the influence of NPRO on BVDV virulence in calves. The virulence of a noncytopathic NADL BVDV with a functional N PRO [i-NADL.del (ins)] was compared with the virulence of i-NADL.del (ins) with a dysfunctional NPRO as a result of fusion with EGFP [i-NADL.del (ins)-EGFP] by experimentally infecting dairy calves with each virus. Calves infected with i-NADL.del (ins) developed elevated body temperatures, viremia, as well as marked lymphoid depletion and extensive deposition of BVDV antigen in lymphatic tissue. Calves infected with i-NADL.del (ins)-EGFP developed low-level viremia, and mild lymphoid depletion with minimal BVDV antigen deposition in lymphatic tissues. These results provide evidence for a correlation of BVDV virulence with the presence of a functional NPRO. Studies are underway to assess host innate and adaptive immune

responses as well as the level of protective immunity afforded by vaccination of calves with this attenuated, noncytopathic BVDV mutant.

IMPACT STATEMENT

BVDV infections have a significant negative impact on animal well-being and profitability in the US cattle industry. BVDV vaccines are available to help control those infections; however, the vaccines do not provide complete protection. Our research on the molecular basis of virulence contributed to the understanding of mechanisms involved in BVDV infections and will facilitate research aimed at identifying safe, effective vaccine candidates.

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NEB 14-121

Evolving Pathogens, Targeted Sequences and Strategies for Control of Bovine Respiratory Disease

Clinton J. Jones

BHV-1 is a significant viral pathogen of cattle that can induce respiratory disease, abortion, or occasionally encephalitis. BHV-1 has also been frequently found in buffalo, which is a growing food animal source in the US. BHV-1 is also a causative agent of "Shipping Fever" or Bovine Respiratory Complex. As a consequence of the pathogenic potential of BHV-1, the cattle industry suffers more than $500,000,000/year in losses.

BHV-1 typically initiates infection in mucosal epithelial surfaces located in the eyes, nose, mouth, upper respiratory tract, or genital tract. Extensive viral gene expression occurs, virus is shed, and clinical symptoms are apparent. Virus then enters the peripheral nervous system, where it establishes a latent infection in sensory neurons. Viral DNA can persist in a latent state for the lifetime of the infected host or it can periodically reactivate. In contrast to the 70-80 viral genes expressed in epithelial cells, only one small region of the viral genome is transcriptionally active in latently infected neurons. This region is designated the latency related (LR) gene. LR-RNA is transcribed from the opposite strand of an immediate early gene (ICP0) that activates productive gene expression. A latent infection can be operationally divided into 3 distinct stages: 1) establishment, 2) maintenance, and 3) reactivation form latency. Latency is crucial for pathogenesis and virus transmission in nature.

A. Accomplishments related to understanding the functions of the LR gene

We have previously demonstrated that the LR gene encodes a protein that is expressed in sensory neurons and during productive infection. Site-directed mutagenesis indicated that ORF-2 expression is required for the latency-reactivation cycle of BHV-1 in cattle. The LR gene interferes with apoptosis, which promotes neuronal survival during the transition from acute infection to latency. The LR gene also appears to encode a small non-protein coding RNA that inhibits cell cycle progression, which may play an important role in restricting viral gene expression in sensory neurons. Finally, LR-RNA sequences or a small open reading frame appears to inhibit bICP0 expression (the gene that is anti-sense to the LR gene), and consequently can inhibit viral gene expression. We believe that the LR gene encodes multiple functions that cooperate to regulate latency. The dominant function is a protein encoded by ORF-2 that is absolutely required for the latency-reactivation cycle in cattle.

The LR gene also plays a role in the ability of BHV-1 to grow in the tonsils of infected calves. Although the LR mutant virus can persist in the tonsils of latently infected calves, it does not reactivate from latency. Studies that are in progress now are designed to compare viral gene expression in TG or tonsils of calves latently infected with wt BHV-1 or the LR mutant.

A small open reading frame was identified within the LR transcriptional promoter (ORF-E). A small transcript that encompasses ORF-E is expressed in trigeminal ganglia of latently infected calves. Studies designed to test

whether ORF-E encodes a protein are currently underway.

We are also performing a study with Pfizer to compare BHV-1 strains in aborted fetuses to strains used to vaccinate the respective herds. The strains from aborted fetuses came from Texas and Western Nebraska. Interestingly, these strains do not appear to be identical to the Pfizer's vaccine strains or to the Cooper strain we use in the lab.

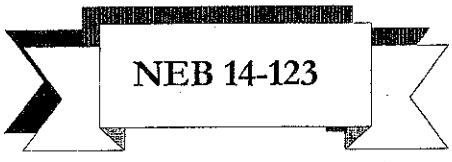
The BHV-1 latency project is funded by a USDA grant that is entitled Regulation of the latency-reactivation cycle by the Bovine Herpesvirus 1 (BHV-1) Latency Related Gene (11-1-2003 to 10-30-2006), and a contract from Pfizer.

B. Analysis of the bICP0 gene

bICP0 is considered to be most important transcriptional regulatory gene of BHV-1 and as discussed above is antisense to the LR gene. In addition to regulating transcription, bICP0 is toxic to cells, but does not appear to directly induce apoptosis. bICP0 contains a C3HC4 zinc RING finger at its amino terminus. Other proteins that regulate transcription, oncogenesis, and growth also contain zinc ring fingers. Site-specific mutagenesis on the C3HC4 zinc RING finger revealed this domain is necessary for toxicity and eliminates transcriptional regulatory activity. Since bICP0 does not specifically bind DNA, we have hypothesized that bICP0 interacts with transcription factors. Earlier studies from my laboratory have demonstrated that bICP0 interacts with histone deacetylase 1 (HDAC1). HDAC1 represses transcription because it removes acetyl groups from histones, thus making chromatin transcriptionally inactive. We have also determined that bICP0 binds p300, a histone acetyltransferase that regulates transcription. We believe that the ability of bICP0 to interact with HDAC1 and p300 promotes productive infection.

To begin to identify bICP0 functional domains that are not part of the zinc RING finger, we developed a panel of transposon insertion mutants that span bICP0. A large domain spanning amino acids 78-256, and a separate domain that is at or near amino acid 457 was necessary for efficient trans-activation of a simple promoter. Transposon insertion at amino acid 91 impaired bICP0 protein stability in transfected cells. Insertion of transposons into the acidic domain of bICP0 had little or no effect on trans-activation of a simple promoter or protein expression suggesting this region does not play a major role in activating gene expression. Sequences near the C-terminus (amino acids 607-676) contain a functional nuclear localization signal (NLS). Collectively, our studies indicated that bICP0 contains several important functional domains; 1) the zinc RING finger, 2) two separate domains that activate transcription, and 3) a C-terminal NLS that is also necessary for efficient trans-activation.

The bICP0 studies are funded by a grant entitled Functional analysis of bICP0, a BHV-1 gene that is a promiscuous trans-activator (9/1/2002 to 8/30/2005). A renewal of this grant was recently funded by the USDA. The title of the renewal is Functional analysis of bICP0, a BHV-1 gene that is a promiscuous trans-activator (9/1/2005 to 8/30/2008).



Develop Pre-Harvest Version of the USDA-FSIS Fast Antibiotic Screening Test and Antibiotic Residue Avoidance Education

D. D. Griffin

The first objectives, to develop a live animal test equivalent to FAST by determining the minimum inhibitory concentration (MIC) of commonly used antimicrobials on Bacillus megaterium has been accomplished, validation of these results, testing of antibiotic spiked urine and in-vivo testing of 12 classes of antibiotics in cattle born in the spring of 2003 and 2004, and whose health histories were traced from birth to the farm of origin has been completed. Using cattle that can be traced from birth insures a complete analysis of health treatment records. Cattle with a history of antibiotic treatment were excluded. Minimum inhibitory concentrations (MIC) for 12 different antibiotics commonly used in the field, using the ATCC reference strain 9885 of B. megaterium will be determined and compared to the in vitro results. Originally 14 total antibiotics were included but due to FDA AMDUCA regulations two antibiotics from the class aminoglycosides (gentamicin, neomycin) had to be excluded because of prolonged

residue potential. The following antimicrobial groups were represented: aminocyclitols (spectinomycin), beta-lactams (penicillin G, ampicillin, ceftiofur), chloramphenicol derivatives (florfenicol), fluoroquinolones (enrofloxacin), lincosamides (lincomycin), macrolides (tilmicosin, tylosin,), sulfonamides (sulfadimethoxine, sulfamethazine), and tetracyclines (oxytetracycline). A unique renal biopsy technique was developed which use a copotamy approach. A large three millimeter biopsy instrument was developed as the available commercial biopsy instrument did not retrieve a sufficient sample for HPLC analysis. All the sample were collected without apparent discomfort or harm to the cattle used in this project. The renal tissue samples are awaiting analysis.

The preliminary outline for the field instruction manual for use of the Pre-Harvest Antibiotic Screening Test has been developed and is being evaluated by 20 practicing beef feedlot veterinarians. These veterinarians are located in six states (Colorado, Iowa, Kansas, Nebraska, Oklahoma and Texas).

IMPACT STATEMENT

Presently there is not a pre-harvest antibiotic residue screening test available to mirror the new antibiotic screening test adopted by the USDA-FSIS 2000. This increases the risk of producers marketing an animal with violative residue, risks consumer confidence in the food supply of our nation and potentially impacts the economic sustainability and profitability of the United States beef industry. A pre-harvest antibiotic screening test that mirrors the USDA-FSIS FAST test will be developed. Disseminate the information to producers and veterinarians.

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NEB 14-125

Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety

R. A. Moxley, G. E. Duhamel and D. R. Smith

Escherichia coli O157:H7 is an important zoonotic pathogen, and prevention of infection in cattle has been proposed to reduce the risk of human disease. A large-scale study of 140 pens of cattle from 19 commercial feedlots (n=20,556 head) was conducted in which cattle received two doses of vaccine, and the effects of vaccination on terminal rectal colonization and probability for pens to test positive for *E. coli O157:H7* was determined. The pen-testing strategy consisted of culturing seven ropes per pen hung overnight from feedbunk neckrails, a correlate of fecal shedding prevalence. Vaccinated pens of cattle were 27% less likely to test ropes-positive than non-vaccinated pens. Other variables explaining the probability for pens to test ropes-positive were month of the year, region of the state, the number of cattle within the pen, and condition of the pen surface. Terminal rectum mucosal samples from 720 cattle in 21 pens (11 vaccinated, 10 not vaccinated) selected from 140 pens in the study were cultured. Vaccinated cattle were 76% less likely to be colonized in the terminal rectum compared to non-vaccinated cattle. We concluded that, in commercially fed cattle, the two-dose vaccine regimen reduced the probability of *E. coli O157:H7* colonization of the terminal rectum, and reduced pen-level contamination. *Brachyspira pilosicoli* is a major cause of colonic spirochetosis, a polymicrobial inflammatory bowel disease that affects humans and a wide range of animal species. Five penicillin-binding proteins were identified among human and porcine *B. pilosicoli* strains. Spirochetes that were identified as *B. pilosicoli* were identified in 7.5- to 18-week-old commercial turkeys with cecal spirochetosis and typhlitis. *Enterohepatic Helicobacter* species, including the prototype *H. hepaticus*, are emerging causes of intestinal diseases in humans and animals that produce a novel nuclease toxin, known as cytolethal distending toxin (Cdt). A sensitive fluorometric assay was developed to assess the biochemical properties of the CdtB effector subunit. The Ca2+- and Mg2+-dependence and neutral properties of CdtB were similar to mammalian nucleases, but DNA hydrolysis by CdtB was approximately 100-fold less active and was considerably more resistant to inhibition by ZnCl2 and G-actin than mammalian nucleases. Similar to other gram negative pathogens, the CdtB subunit of *H. hepaticus* localized to the nucleus and alone was sufficient for cellular intoxication. Comparative analysis of CdtB genes and toxins produced by *C. jejuni*, a major cause of food-borne diarrheal illnesses, *C. hyointestinalis*, an emerging cause intestinal diseases in pigs and human beings, and *C. coli* commonly found in intestinal specimens obtained from pigs and other species provided new insights into the pathogenesis of intestinal disease associated with these pathogens and methods for improved detection. By contrast with a recent report suggesting high CdtB activity among *C. coli*

isolated from pigs in Denmark, CdtB activity was not found among US porcine *C. coli*.

IMPACT STATEMENT

A large-scale clinical trial in commercial feedlots provided scientific evidence that vaccination with type III secreted proteins is an effective pre-harvest intervention strategy for the control of *E. coli O157:H7* in feedlot cattle. Identification of penicillin-binding proteins of *B. pilosicoli* provides a basis for development of improved control strategies for pathogenic intestinal spirochetes of humans and animals. *Cecal spirochetosis* caused by *B. pilosicoli* was characterized in commercial turkeys for the first time. Differences between the biochemical properties of Helicobacter CdtB and mammalian nucleases suggest that novel antitoxin control strategies can be developed. A novel Campylobacter cdtB gene encoding a highly toxic CdtB subunit was characterized among porcine and human *C. hyointestinalis*. Porcine *C. coli* are an unlikely source of toxigenic Campylobacter for humans.

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NEB 14-126

Pathogenesis of Bovine Viral Diarrhea Virus and Bovine Respiratory Syncytial Virus Infections

C. L. Kelling

Bovine respiratory disease complex (BRDC) has a major negative impact on profitability in the beef cattle industry. BRDC outbreaks are caused by interactions of multiple ubiquitous pathogens, such as bovine viral diarrhea virus (BVDV) and bovine respiratory syncytial virus in affected animals.

Vaccination against BVDV infection should protect against viremia and prevent dissemination of virus throughout the host following exposure, thus blocking infection of target cells of the reproductive and lymphatic systems and preventing fetal infection and immunosuppression, respectively. The objective of this study was to characterize the level of protection against systemic infection and disease from challenge exposure with NY-1 BVDV afforded by use of a modified-live, noncytopathic BVDV type 1 vaccine. Calves, 5-7 months old, were allotted to two groups, Group 1, not vaccinated (n = 5), and Group 2, vaccinated (n=5). Calves in group 2 were vaccinated subcutaneously on day 0 with BVDV 1 (WRL strain) in a combination vaccine containing other MLV fractions. Calves in both groups were challenged intranasally on day 21 postvaccination with NY-1 BVDV. Rectal temperatures and clinical signs of disease were recorded daily. Total and differential white blood cell and platelet counts were performed. Histologic examination and immunohistochemical analysis were conducted postmortem to detect lesions and distribution of viral antigens, respectively. Vaccine virus replicated systemically in vaccinated calves as evident antemortem by transient decreased peripheral leukocyte and lymphocyte counts as well as evident postmortem by lymphoid depletion in Peyers patches and mesenteric lymph nodes. Post-challenge, nonvaccinated calves developed elevated body temperatures, respiratory tract disease signs, viremia, leukopenia, lymphopenia and thymic infection. In contrast, post-challenge, vaccinated calves did not exhibit fever nor signs of respiratory tract disease. Post-challenge with NY-1, vaccinated calves were protected against systemic replication of challenge virus since they did not develop reduced leukocyte counts and were protected against viremia and infection of target lymphoid cells.

IMPACT STATEMENT

The BRDC causes a significant negative impact on animal well-being and profitability in the U.S. cattle industry. BVDV infections are important causes of BRDC and vaccines are available to help control those infections; however, the vaccines do not provide complete protection. Our research contributed to the understanding of mechanisms involved in BVDV infections. This understanding is useful for developing effective intervention strategies to help control BRDC to enhance animal well-being and increase profitability.

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NEB 14-127 Internention Strategies to Reduce *Escherichia Coli* O157:H7 in Beef Feedyards

D. Smith, G. Erickson, R. Moxley, T. Klopfenstein and S. Hinkley

The specific aims of this project are: 1) to field test the effect of vaccination and feeding direct-fed microbials for singular, additive or interactive effects on the prevalence of *E. coli O157:H7* in feedlot cattle; and 2) to share our findings with cattle producers, veterinarians, food safety researchers, food safety policy makers, and other stakeholders through extension programming.

A phase III clinical trial was conducted to field test the effect of 1) vaccination, and 2) feeding a direct-fed microbial product on the prevalence of *E. coli O157:H7* in commercial feedlot cattle. Feedlots were classified as either feeding or not feeding BovamineTM (Lactobacillus acidophilus and Propionibacterium freudenreichii) and pens of vaccinated and nonvaccinated cattle within feedlots were matched by time in a split plot design with the whole plot factor being Bovamine TM and the split plot factor being vaccination. Vaccine was given to cattle at initial processing and again at reimplanting. Each pen of cattle enrolled in the study was sampled for *E. coli O157:H7* starting at least one week after the second dose of vaccine was given, and continued every three weeks for four test period samplings. Pens were sampled for O157 by hanging seven ROPES from the neckrail of the feedbunks where cattle could easily lick, chew, or rub on them. *E. coli O157:H7* was isolated and identified by standard methods involving selective enrichment, immunomagnetic separation, agar plating, biochemical and immunological testing and PCR confirmation. The outcome was whether or not pens tested positive for *E. coli O157:H7* using the ROPES device. Recovery of *E. coli O157:H7* from at least one ROPES classified the pen as positive. The probability for pens of cattle to test ROPES-positive was modeled in a generalized estimation equations (GEE) model using the logit link function and accounting for clustering by matched pairs of pens within feedlot and repeated measures. We studied 140 pens of cattle (n=20,556 head) in 19 feedlots. Vaccinated pens of cattle were less likely to test ROPES-positive (OR=0.59, P=0.004). Other variables in the model were month of the year, region of the state, the number of cattle per pen, and pen surface condition. At harvest, terminal rectum mucosal cells (TRM) were collected from a sample of cattle from a proportion of vaccinated and unvaccinated pens to assess for colonization. The TRM were collected by scraping the mucosa of the terminal rectum 3-5 cm proximal to the rectoanal juncture. The probability to detect E. coli O157:H7 from TRM was modeled using a generalized linear mixed model (GLMM) with a logit link function and accounting for random effect of pen. 720 cattle were tested from within 21 pens of cattle (11 vaccinated, 10 not vaccinated). We observed a 75% lower probability for *E. coli O157:H7* colonization at harvest among vaccinated cattle (OR=0.20; P=0.03). We concluded that the two-dose vaccine regimen reduced the probability of *E. coli O157:H7* colonization of the terminal rectum in commercially fed cattle at harvest.

Impact Statement

These data suggest that vaccination reduced *E. coli O157:H7* colonization of cattle and lowered the environmental burden of exposure. Therefore, this strategy may be promising for pre-harvest control of *E. coli O157:H7* in commercially fed cattle. Extension programming will help veterinarians and cattle feeders become aware of how they can apply effective interventions to improve the safety of food.

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NEB 14-128 Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1(BHV-1) Latency Related (LR) Gene

C. J. Jones and A. R. Doster

Bovine herpesvirus 1 (BHV-1) is an important pathogen of cattle that belongs to the α- herpesvirus subfamily.

Like other members of this subfamily, a latent infection is established in sensory neurons following acute infection. However, the virus can reactivate and spread to other cattle. Reactivation from latency is the mechanism by which the virus survives in nature, and is thus, an important property of pathogenesis. During a latent infection, one abundant viral transcript can be detected, the latency related RNA (LR-RNA). Plasmids expressing LR gene products enhance survival of monkey kidney cells (CV-1), neuronal like cells (neuro-2A), and human lung cells (IMR-90) after treatment with chemicals that induce apoptosis. We have developed a LR mutant does not express the LR protein encoded by ORF-2. This mutant grows well in tissue culture, but does not grow well in the eyes or tonsil during acute infection of calves. Furthermore, the LR gene mutant does not reactivate from latency indicating that the LR gene is important for the latency-reactivation cycle in calves. Immune infiltration into trigeminal ganglia (TG) occurs as a result of infection and it is believed this is important for regulating latency. Calves infected with the LR mutant contain enhanced immune infiltration and programmed cell death (apoptosis) in TG at the end of acute infection. In addition, the LR gene regulates interferon RNA expression in productively infected calves and cultured bovine cells suggesting this is the mechanism by which the LR gene regulates lymphocyte infiltration into TG.

IMPACT STATEMENT

BHV-1 is an important pathogen of cattle, which costs the cattle industry one-half billion dollars per year in the US. The ability of BHV-1 to infect lymphocytes is believed to enhance pathogenesis and virus transmission. We are trying to understand virus host interactions in the peripheral nervous system to facilitate production of a better vaccine.

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NEB 14-129 Molecular Analysis of a Mycobacterium Paratuberculosis Colony-Morphology Attenuated Mutant

R. G. Barletta

Mycobacterium avium subsp. paratuberculosis (MAP) is the etiological agent of a severe gastroenteritis in ruminants, known as Johnes disease. In the United States alone, economic losses for the dairy industry are estimated to be over $1.0 billion per year. Survival within macrophages is a hallmark of MAP. Identification of genes responsible for MAP survival in macrophages is important to understand how this bacterium causes disease. This project is focused on the MAP mutant 4H2 that displays a colony morphology alteration and an attenuated phenotype in bovine macrophages. In this reporting period, we compared the phagocytosis of MAP wild type by freshly isolated bovine monocytes and a bovine macrophage cell line. Bovine monocytes exhibited a greater ability to phagocytose MAP (i.e. greater percentage of infected cells, and more bacilli per infected cell), than did a bovine macrophage cell line. Phagocytosis of MAP by monocytes, but not the cell line, was significantly enhanced by the addition of autologous serum. Following ingestion, the number of viable MAP cells in monocytes increased during the first 4 days and then declined between day 4 and day 8 after infection, as determined by a radiometric method. The numbers of MAP remained largely unchanged in the cell line during the same incubation period. The number of microscopically visible acid-fast bacilli increased with time in monocytes, but not in the macrophage cell line. These observations suggest that replication and inhibition of bacilli may both occur in monocytes. The difference in the ability of bovine monocytes and the macrophage cell line to ingest and restrain the intracellular growth of MAP provide valuable model systems for investigating various aspects of how MAP enters and persists within its preferred niche, the mononuclear phagocyte. Similar experiments with mutant 4 H2 are in progress. In addition, Southern blot and PCR analyses are consistent with the inactivation of MAP 1152. However, transposon insertions may have polar effects and thus, we are carrying complementation tests with all wild type genes in the region immediately downstream to the transposon insertion site including genes MAP1152-1153-1155 and 1156. Transformants will be verified and tested for survival in bovine macrophages.

IMPACT STATEMENT

Paratuberculosis and related mycobacterioses cause an estimated one billion dollars in annual losses to U.S. agriculture alone. Molecular genetic studies of MAP mutants attenuated for survival in bovine macrophages may aid in the development of a live-attenuated vaccine to control Johnes disease.

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NEB 14-130

Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1(BHV-1) Latency Related (LR) Gene

C. J. Jones

Bovine herpesvirus 1 (BHV-1) is an important pathogen of cattle that belongs to the α- herpesvirus subfamily. Like other members of this subfamily, a latent infection is established in sensory neurons following acute infection. However, the virus can reactivate and spread to other cattle. Reactivation from latency is the mechanism by which the virus survives in nature and is thus an important property of pathogenesis. During a latent infection, one abundant viral transcript can be detected, the latency related RNA (LR-RNA). Plasmids expressing LR gene products enhance survival of monkey kidney cells (CV-1), neuronal like cells (neuro-2A), and human lung cells (IMR-90) after treatment with chemicals that induce apoptosis. We have developed a LR mutant does not express the LR protein encoded by ORF-2. This mutant grows well in tissue culture, but does not grow well in the eyes or tonsil during acute infection of calves. Furthermore, the LR gene mutant does not reactivate from latency indicating that the LR gene is important for the latency-reactivation cycle in calves. Immune infiltration into trigeminal ganglia (TG) occurs as a result of infection and it is believed this is important for regulating latency. Calves infected with the LR mutant contain enhanced immune infiltration and programmed cell death (apoptosis) in TG at the end of acute infection. In addition, the LR gene regulates interferon RNA expression in productively infected calves and cultured bovine cells suggesting this is the mechanism by which the LR gene regulates lymphocyte infiltration into TG.

IMPACT STATEMENT

BHV-1 is an important pathogen of cattle, which costs the cattle industry one-half billion dollars year in the US. The ability of BHV-1 to infect lymphocytes is believed to enhance pathogenesis and virus transmission. We are trying to understand virus host interactions in the peripheral nervous system to facilitate production of a better vaccine.

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NEB 14-131

Veterinary Field Disease Research Program

D. R. Smith

The Field Disease Research Program uses a team approach to solve problems of animal or human health related to livestock production systems. Currently research is underway to 1) estimate the proportion of Nebraska beef cattle herds with Johne's disease and identifying factors associated with Johne's disease status; 2) use microscopic examination of immunohistochemistry-stained skin biopsies to detect and remove calves born persistently infected with BVDV from a commercial cow-calf ranch; 3) validate of the use of serology among unvaccinated sentinel beef calves to detect evidence of BVDV exposure during the period when their dams are carrying fetuses susceptible to BVDV infection and subsequent development of the PI state.

Seventy-three cow-calf herds representing 20,865 cows were extensively tested for the presence of Johne's disease using a serial testing strategy (ELISA serology followed by fecal culture confirmation of positives). Mean herd size was 286 head, ranging from 94-1,700 cows per herd. A total of 15,402 cows were tested following a pre-determined

sampling strategy. Johne's disease was identified in 9 herds (12%). Factors significant as univariate risk factors for Johne's disease positive herds were: 1) the presence of Johne's disease suspect animals in the calving area, or 2) with pre-weaned calves, and 3) exposure of pre-weaned calves to manure contaminated water. Of these variables, the presence of Johne's suspects in the calving area was most explanatory of the herd's Johne's disease status.

BVDV was eliminated from a 600 head cow-calf ranch by testing calves at birth using microscopic examination of immunohistochemistry-stain skin biopsies collected from the ear margin (ear-notch test) to detect calves born BVDV persistently infected (BVDV-PI). Calves ear-notch test-positive in 2003 were removed from the cow herd prior to the breeding season. No calves were born BVDV-PI in 2004 or 2005. Tests in previous years identified the presence of PI calves and BVDV transmission could be traced to breeding pastures where PI calves were present. BVDV serology from 10% of weaned calves from herds with and without BVDV are being evaluated for herd-level diagnostic value. Because of maternal antibodies, titers to BVDV are variable and age-dependent. Data analysis of this years serology results is still underway. Data were analyzed to identify the risk factors for neospora transmission in dairy cattle and the presence of virulence factors among *Moraxella ovis*. Papers were published describing the ecology of *E.coli O157:H7* and Salmonella in fed cattle populations.

IMPACT STATEMENT

Neospora, Johne's disease, neonatal diarrhea and BVDV are economically important diseases of cattle. The results of these studies help veterinarians know how to diagnose a herds status for these diseases or to understand how their producer clients may risk exposure and further transmission of the agents of these diseases in their herds. Understanding the ecology of food safety pathogens in cattle environments is important to designing strategies for intervention.

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NEB 14-132

Examination of Attenuation and Virulence Determinants of Porcine Reproductive and Respiratory Syndrome Virus

A. K. Pattnaik and F. A. Osorio

We have generated an infectious molecular clone (PP-18) from the Prime Pac attenuated vaccine strain of PRRSV. The viral genome is 15,520 nucleotides long excluding poly (A) tail which is the same length as the parental virus. The full-length cDNA clone was assembled in pBR322 after incorporating T7 RNA polymerase promoter. *In vitro* transcribed RNAs, when transfected into MARC-145 cells resulted in production of infectious virus. The rescued virus had the similar growth properties in both MARC-145 cells and porcine alveolar macrophages (PAMs) as the parental vaccine virus. The derivation of this infectious clone from the attenuated PRRSV vaccine strain should significantly facilitate ongoing molecular attenuation studies by providing an avirulent phenotypic background on which to evaluate the contribution that single wt PRRSV genes may have on virulence. We have also generated a series of chimeric viruses containing specific genomic sequences of an attenuated PRRSV vaccine strain (Prime Pac) within the genomic context of a highly virulent infectious clone (FL-12). Eight viable chimeras, encompassing the entire genome of Prime Pac, have been obtained. Clear-cut characterization of the chimeric viruses for virulence phenotype was obtained in vivo, upon inoculation of pregnant sows at day 90 of gestation. Most virulence determinants clustered in the structural genes of PRRSV. Some non-structural regions of the PRRSV genome (NSP3-8) exhibited a marked role in virulence. Meanwhile, other non- structural regions (NSP1-3, NSP10-12) showed an intermediate attenuation phenotype, while other non-structural (NSP9) or structural (ORF2) regions could be ruled out as important determinants of virulence. We further dissected the structural genes for a finer mapping and generated 5 chimeras representing the majority of each individual ORF, 3 through 7. The *in vitro* growth kinetics in both MARC-145 cells and PAM and *in vivo* characterization in pregnant sows are currently in process. This approach should allow us to narrow down the relative contribution of individual ORFs on attenuation of virulence of PRRSV, thus opening the avenue for precise mapping of the critical regions and residues within the individual gene

products that are important for attenuation.

IMPACT STATEMENT

Porcine reproductive and respiratory syndrome (PRRS) in pigs is a complex disease responsible for significant economic losses to the swine industry. The virus, PRRSV in not well characterized and current vaccines are less efficacious. Using a reverse genetic approach, we attempt to understand the genetic determinants of PRRSV that are responsible for causing disease in infected pigs and how such information can be used for generation of safer and efficacious vaccine to combat PRRS.

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NEB 14-133

Analyses of Virulence and Attenuation Determinants of Porcine Reproductive and Respiratory Syndrome Virus Using Reverse Genetics Approach

A. K. Pattnaik and F. A. Osorio

During the past year, we have been able to generate a series of chimeric viruses containing specific genomic sequences of an attenuated PRRSV vaccine strain (Prime Pac) within the genomic context of a highly virulent infectious clone (FL-12). Eight viable chimeras, encompassing the entire genome of Prime Pac, have been obtained. Five of the chimeras include all the non- structural open reading frames (ORFs): (1) 5'UTR and NSP1 and part of NSP2, (2) part of NSP2 and part of NSP3, (3) part of NSP3 to NSP8, (4) part of NSP9, and (5) part of NSP9 to NSP12 genes; while the remaining 3 chimeras include all the structural ORFs: (6) part of NSP12, ORF2 and part of ORF3, (7) ORF3 to 7 and 3'UTR, and (8) the entire region spanning all the structural genes and the 3'UTR. Clear-cut characterization of their virulence phenotype was obtained *in vivo*, upon inoculation of pregnant sows at day 90 of gestation. Most virulence determinants clustered in the structural genes of PRRSV. Some non-structural regions of the PRRSV genome (NSP3-8) exhibited a marked role in virulence. Meanwhile, other non-structural regions (NSP1-3, NSP10-12) showed an intermediate attenuation phenotype, while other non-structural (NSP9) or structural (ORF2) regions could be ruled out as important determinants of virulence. We further dissected the structural genes for a finer mapping and generated 5 chimeras representing the majority of each individual ORF, 3-7. The *in vitro* growth kinetics in both MARC-145 cells and PAM and *in vivo* characterization in pregnant sows are currently in process. This approach should allow us to narrow down the relative contribution of individual ORFs on attenuation of virulence of PRRSV, thus opening the avenue for precise mapping of the critical regions and residues within the individual gene products that are important for attenuation. To complement the experiments involving a virulent infectious clone (FL-12), we have also generated an infectious clone (PP-18) from this Prime Pac attenuated vaccine strain. The complete nucleotide sequence was determined and compared with parental vaccine virus. The viral genome is 15,520 nucleotides long excluding poly (A) tail which is the same length as the parental virus. A number of changes in nucleotide sequence were noted. A full-length cDNA clone was assembled in pBR322 after incorporating T7 RNA polymerase promoter. *In vitro* transcribed RNAs, when transfected into MARC-145 cells resulted in production of infectious virus. The rescued virus had the similar growth kinetics in both MARC-145 cells and porcine alveolar macrophages as the parental vaccine virus and could be differentiated from the other American type viruses by indirect fluorescent staining with specific Mabs (SDOW17 and SR30). The derivation of this infectious clone from the attenuated PRRSV vaccine strain should significantly facilitate ongoing molecular attenuation studies by providing an avirulent phenotypic background on which to evaluate the contribution that single wt PRRSV genes may have on virulence.

IMPACT STATEMENT

Porcine reproductive and respiratory syndrome virus (PRRSV) is responsible for significant economic losses to

the swine industry. The goal of the project is to gain knowledge about the determinants of virulence and attenuation of PRRSV, which will be important towards developing safer and more efficacious vaccine to combat the disease.

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NEB 14-134 Influence of Enterotoxins on Virulence and Colonization of the Porcine Intestine by *Escherichia coli*

R. A. Moxley

Enterotoxigenic *Escherichia coli* (ETEC) is an important cause of diarrhea and death in human beings and animals. This study was conducted as a step towards understanding the biological roles of *E. coli* enterotoxins in intestinal colonization and pathogenesis of disease in piglets. The lambda Red-mediated recombinogenic system has been widely used for gene inactivation in yeasts and different pathogenic bacteria, but to our knowledge, not ETEC. This approach is simpler and more efficient than conventional methods of allelic exchange. In the study herein, this system was used or homologous recombination by two approaches, both plasmid based. In the first approach, amplification of an antibiotic insertion-inactivated enterotoxin gene in a plasmid vector with primers outflanking that gene was done, resulting in a linear PCR product containing the antibiotic gene outflanked on either side by enterotoxin gene nucleotides. In the second approach, enterotoxin genes were disrupted using PCR products from primers specifically targeting antibiotic markers, flanked on either side by short homologies to 5 primer ends of target genes. Conditions were identified that optimize use of the lambda Red system for recombineering in ETEC. Lambda Red and FLP recombinase helper plamids were used with successful disruption of enterotoxin genes in ETEC. We examined the use of plasmid-derived short (60-bp) and long (>100-bp) PCR-generated homology products, both of which worked well. Recombinants were selected on respective antibiotics, PCR-analyzed and mutagenesis confirmed using Southern blots. The success of lambda Red-mediated recombination in ETEC depended on a number of factors, such as the orientation of the antibiotic marker in the recombination substrates, amount of PCR product, buffers used to make the bacteria electrocompetent, heat shock effects, electroporation conditions and exposure to UV, among others. Overall, we have optimized the lambda Red recombineering technology for use in ETEC, as demonstrated by the precise disruption of the estB and eltAB genes, results which encourage further use of this technology in studies aimed at the elucidation of gene function.

IMPACT STATEMENT

Methods for the inactivation of enterotoxin genes in Escherichia coli were optimized, which should facilitate studies aimed at the elucidation of gene function.

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NEB 14-136 Tricarboxylic Acid Cycle Mediated Regulation of Staphylococcus Aureus Bovine Mastitis

Greg A. Somerville

Aconitase is a bifunctional protein having both an enzymatic and regulatory function. Inactivation of the aconitase gene in the human and animal pathogen. *Staphylococcus aureus* caused a significant reduction in the production of several virulence factors and enhanced long-term survival relative to the wild-type strain. The purpose of this project is to identify those genes that are affected by aconitase inactivation and to determine if those genes are affected by the loss of enzymatic activity or regulatory function. To accomplish this goal, we will employ DNA microarray technology using three tricarboxylic acid cycle mutants. Phase 1 of this project is to construct *S. aureus*

strains bearing mutations in either the isocitrate dehydrogenase gene or the citrate synthase gene. During the past year, the plasmids necessary to inactivate these genes were constructed and the screening of putative mutants has begun. We anticipate completion of the mutant construction by early next year. Phase 2 of the project is to analyze the transcriptional profiles of the three tricarboxylic acid cycle mutants (isocitrate dehydrogenase, citrate synthase, and aconitase) using DNA microarray technology in collaboration with the Department of Pathology and Microbiology at the University of Nebraska Medical Center. We have completed the DNA microarray experiment for the aconitase mutant strain and are awaiting the completion of the additional mutant strains before continuing the microarray experiments. Upon completion of this project, it is anticipated that we will have identified new therapeutic targets to combat *S. aureus* infections.

IMPACT STATEMENT

The bacterium *Staphylococcus aureus* poses major health risks and causes significant economic hardships in the dairy and food industries. As an example, the economic impact of bovine mastitis to Nebraska per year is approximately $13.4 million. The research contained within this proposal is designed to identify novel therapeutic targets in *Staphylococcus aureus*, which will facilitate the development of new drugs to combat bovine mastitis.

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NEB 14-137

Genetic Basis of Resistance to Food-Borne Bacterial Pathogens

G. Duhamel and J. Weber

Campylobacter jejuni and *Eschericha coli* are leading causes of food-borne bacterial infections in humans worldwide. Conversely, *Helicobacter hepaticus* is a well-established cause of chronic hepatitis and liver cancer in susceptible mouse strains. Cytolethal distending toxin (CDT) is a newly discovered virulence factor consisting of a tri-peptide complex of subunit A, B and C which is shared among these bacterial pathogens. The proposed mechanism of CDT toxicity is consistent with that of heterodimeric AB2 bacterial toxins where subunits A and C bind to host cell membrane for cellular delivery of the toxic B subunit. The central hypothesis of this project is that subunits A and C of CDT bind to specific host tissue/cellular receptor(s) resulting in damage and illness. The objective of this project is to characterize the distribution of CDT-binding target tissues in susceptible pigs and susceptible and resistant inbred strains of mice. We have cloned, overproduced, and characterized the biochemical properties of H. hepaticus CdtB in details. Hexahistidine (His6)-tagged CDT subunits A, B, and C of *H. hepaticus* and B subunit of *C. jejuni* have been cloned and purified, and monospecific rabbit polyclonal hyperimmune sera have been produced against the B subunits of each pathogen. Currently, His6-tagged A and C subunits of *H. hepaticus* have been cloned and purified for production of rabbit hyperimmune sera whereas over-expression and purification of His6-tagged A and C subunits of *C. jejuni* are in progress.

IMPACT STATEMENT

Identification of cellular targets and receptors for CDT will form the basis for implementation of genetic selection of livestock resistant to these important food-borne bacterial pathogens, and basic understanding of disease susceptibility and resistance to several important bacterial pathogens of humans and animals.

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NEB 14-138

Functional Analysis of BICPO, the Major transcriptional regulatory Gene of Bovine Herpesvirus 1 (BHV-1)

C. J. Jones

Bovine herpes virus 1 (BHV-1) can cause clinical symptoms in cattle and induce shipping fever, which costs the

industry more than $640 million per year. Current vaccines can be pathogenic to small calves, cause abortions, and do not prevent latency of wild-type virus. BHV-1 establishes latency, but can reactivate, in part, because the bICP0 protein activates viral gene expression. bICP0 can activate expression of all three classes of viral genes, is expressed throughout productive infection, and is thus considered to be the most important viral regulatory gene. We have demonstrated that a C3HC4 zinc ring finger near the amino terminus of bICP0 plays an important role in activating transcription and productive infection. Furthermore, bICP0 interacts with chromatin remodeling enzymes {histone deacytlase 1 (HDAC1) and a histone acetylase (p300)}. Recent studies have demonstrated that bICP0 also inhibits interferon dependent transcription, suggesting that bICP0 regulates innate immune responses.

We have recently developed a mutant BHV-1 strain that does not grow efficiently. This mutant grows poorly and does not form well-defined plaques. The mutant virus establishes a persistent infection in cultured bovine cells. In summary, our studies suggest that bICP0 is crucial for productive infection.

IMPACT STATEMENT

BHV-1 is an important pathogen of cattle, which costs the cattle industry one-half billion dollars per year in the US. These studies will help us understand bICP0 function and its relationship to disease and may help the vaccine industry design modified live vaccines that induce immunity, do not cause disease in cattle, and do not reactivate from latency.

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NEB 14-139

Use of a Green-Fluorescent Protein-Expressing Strain of Porcine reproductive and respiratory Syndrome virus for the Study of PRRSV Pathogene

Fernando A. Osorio and Asit K. Pattnaik

Using reverse genetics, we have developed a viable, i.e., infectious mutant Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) that contains the genetic information to produce green fluorescent protein(GFP). The GFP is a non-viral protein (obtained from jellyfish) that produces fluorescence when exposed to ultraviolet light. This recombinant PRRSV has the ability to infect target cells with the same level of efficiency and virulence as the parental PRRSV, while maintaining a steady level of expression of green fluorescent protein in the virus-infected cells and tissues. Therefore, this powerful imaging tool allows us now to easily and unequivocally track, identify and localize single virus-infected cells and tissues throughout the body of the pig; therefore, positioning us to address some fundamental, yet pending issues related to the way PRRSV causes disease *in vivo*. Using this recombinant PRRSV, we should be able to follow the sequential progression of the viral load throughout different target sites in the body during all the phases (acute & persistent) of infection, while looking at the complete phenotypic characterization of the infected cell in each case. We'd give special emphasis to the possible *in vivo* association of PRRSV with some specialized targets, such as dendritic cells, which are of fundamental importance for the establishment of the pig's protective immune response against the PRRSV infection.

The anticipated results of this project consist of obtaining a better picture of how the PRRSV infection progresses throughout the body and how it affects certain cells that are key for protection against the infection and for elimination of this virus from the body.

IMPACT STATEMENT

Porcine reproductive and respiratory syndrome (PRRS) virus imposes devastating effects on swine health and productivity. In the U.S., PRRS virus causes approximately $560 million in losses each year. By comparison, annual losses in the U.S. to classical swine fever (eradicated from the US in 1978) and pseudorabies virus (eradicated from the US in 2004) were estimated at $364 million and $36 million, respectively prior to their eradication. The National Pork Board and the rest of swine industry are considering to initiate a regional/national eradication campaign. So far there is one country (Chile) that has initiated an official eradication campaign.

NEB 14-140

Stimulating the Development of Veterinarians to Serve Rural America

D. Dee Griffin

The grant for this project was funded September 14, 2005. The need for contact with the Academy of Rural Veterinarians has been made and the part-time secretarial staff has been arranged. The evaluation development was started and the first meeting of participants was held in conjunction with the Academy of Veterinary Consultant meeting, December 4 in Denver, Colorado.

IMPACT STATEMENT

Presently, there is national concern with the shortage of veterinarians to serve rural communities. This project is aimed to improve the visibility of opportunities for graduating veterinarians across the United States.

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
2005 INTERNATIONAL ACTIVITIES

•Raúl G. Barletta

Special International Contract

Memorandum of Understanding: Corporacion para Investigaciones Biologicas (CIB, Medellin, Colombia) and the Institute of Agriculture and Natural Resources (IANR), Cooperation in the field of Veterinary and Biomedical Sciences, May 2001-May 2007

Specific Project: Mycobacterial drug targets. Corporacion para Investigaciones Biologicas (CIB, Medellin, Colombia). PIs: RG Barletta (UNL), J Robledo (CIB), O Chacon (UNL-CIB). Funded by NIH and USDA. PIs subcontracts and Colciencias (Colombian Federal Agency for Science); Approximately $150,000; 01-01-03/12-31-05

•Marjorie F. Lou

Dr. Lou continues to be the Founder and organizer of the Asian Cataract Research Conference. She continues to organize the Biannual Conference that will be held in a major city in Asia. The 6th Conference will be held in Beijing, China, June 3-7, 2006, which Dr. Lou has been actively supervising the progress of the local organizers. For the same reason, she is actively promoting and sponsoring lens and cataract research programs in Asian countries, such as South Korea, Hong Kong, China, India, Pakistan and Singapore.

Dr. Lou is an elected representative and she will direct, for North America, scientific programs for the Lens Section for The Annual European Eye and Vision Research Conference at Alicante, Spain, October 2001-2002. She has been re-elected to the same post for October 2003-2005.

Dr. Lou was elected as Membership Committee Chairman for the International Society for Eye Research (ISER), 2004-2007.

Dr. Lou continues to be Board of Trustees for the National Foundation for Eye Research since 1998.

Dr. Lou has been elected as Kwan-Biao Zhao Distinguished Professor at Zhejiang University for 2004-2007. She has been establishing various research programs in the Department of Ophthalmology, Sir Run Run Shaw Hospital, Zhejiang University School of Medicine, Hangzhou, China.

•Fernando A. Osorio

Dr. Fernando Osorio has been elected Chair , University of Nebraska-Lincoln, Advisory Committee, International Student Affairs, July 2002-June 2005.

Dr. Osorio continues to serve as an Advisor for the PRRSV Eradication Campaign in Chile.

Dr. Osorio serves on the International Veterinary Advisory Board, Pig Improvement Corporation, Ensminger International School on Swine Diseases in China, October 2005.

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
VETERINARY EXTENSION PROGRAM

Topics/Titles of Extension Program Emphases

Dicky Dee Griffin

Pre-Harvest Food Safety

The focus is education of production management influencers, both Extension Educators and Veterinarians on techniques that will build good production management practices into beef production. Special effort is made with Beef Quality Assurance (BQA) and antibiotic residue avoidance. The program also focuses on the financial assessment of production management changes.

Biosecurity and Security in Beef Production Systems

The focus is education of biosecurity and security principles applied appropriately to fit the needs of the beef production unit. The Hazard Analysis Critical Control Points (HACCP) system is used as the technique evaluation and design of the appropriate biosecurity and security system for each operation.

David R. Smith

Communicating the principles of biosecurity and pathogen containment; emphasizing diagnostics and the role of production-systems on transmission of pathogens and the resulting impact on dairy and beef cattle health and pre-harvest food safety. Internet: <http://vbms.unl.edu/extension.shtml>

EXTENSION FACULTY PROGRAMS

D. Dee Griffin, DVM, MS
Feedlot Veterinarian

Washington, June 24, 2005, the beef industry has had a major setback this year with the announcement of The Veterinary Laboratories Agency in Weybridge, England, confirming that a sample from an animal that was blocked from the food supply in November 2004, has tested positive for Bovine Spongiform Encephalopathy (BSE). However, the adverse effects of BSE on our markets and the continued squabble between the NCBA and RCALF has caused cattle producers to be extremely cautious. USDA scientists will work with international experts to thoughtfully develop a new protocol that includes performing dual confirmatory tests in the event of another "inconclusive" BSE screening test. Currently, nearly 1,000 animals per day are being tested as part of the BSE enhanced surveillance program.

In 2005, the first focus of my program will involve the support of the Nebraska Cattlemen (NC) and the National Cattlemen's Beef Association (NCBA) Beef Quality Assurance (BQA) training efforts. Objectives to reach this goal is to 1) work with the NC to implement the usage of the NC-BQA trainer and producer re-certification self-study materials and 2) continue to develop pre-harvest HACCP materials. I have accomplished the revision of the BQA Manual, including the Spanish version. I continue to host the National BQA Internet site and have made all our QA materials available to the state BQA programs. I also served on the NCBA National BQA Advisory Board and was a lead BQA trainer in Nebraska.

My second focus in my program will involve Pre-Harvest Antibiotic Residue Avoidance research. I have successfully completed the second-year of the three-year funded research project for development of a pre-harvest version of the USDA-FSIS FAST producer. The Objectives and Accomplishments included; completing the *in vivo* antibiotic sensitivities for 15 antibiotics commonly used in cattle and completed the renal biopsy technique development required for the second year research schedule. Accomplishments included; with the substantial increase in cattle prices the money initially budgeted for animal use was insufficient. A creative collaboration was made with the US-MARC and the research proceeded on time and under budget and 2) I developed a new technique for collecting a kidney biopsy using minimal surgical invasion.

My third focus in my program will involve Integrate the biosecurity teaching materials developed last year into my feedlot production management class. I will link biosecurity management with all other production management activities. Objectives to complete my goals will include link biosecurity management with all other production management activities. I will develop

a teaching CD that contains Biosecurity management templates that associated with major production management areas.

My last focus in my program will involve Career education and outreach to Nebraska high school students. I will work with the career education of Nebraska secondary education and undergraduate students and 2) assist Nebraska high school students in developing science projects. Objectives and are to work with at least one high school student science project, 2) host the UNL Pre-Veterinarian Club at GPVEC and 3) participate in at least one Career Day. This will impact and improve future educational choices and strengthen the bond between citizens in our state.

David R. Smith, DVM, PhD
Dairy and Beef Cattle Veterinarian

The essential focus of my extension and research programming is communicating and applying various principles of biosecurity and pathogen-containment, especially as they relate to protecting both cattle and public health. I have continued to emphasized population diagnostics and the role of animal production systems on transmission of cattle diseases and human food-borne pathogens.

I will continue to organize and moderate weekly meetings for discussions on current issues in livestock and public health related to animal production systems. These meetings will continue to foster collaborations and communications between faculty, regulatory veterinarians, public health officials and veterinarians. My goal is to formulate new research strategies and solve animal or human health problems related to livestock production. Keeping updated in the areas of bioterrorism preparedness, the use of antibiotics in animal agriculture, including field investigations in beef calf scours, *Salmonellosis* in a dairy and bovine viral diarrhea in Sandhills ranchers is critical to my extension mission.

My field research projects are underway to better understand biosecurity and the diagnosis in how to control bovine viral diarrhea virus and Johne's disease in cow-calf operations and *Escherichia coli* O157:H7 and *Salmonella* in feedlot cattle. I will continue to conduct animal disease outbreak investigations on Nebraska cattle operations related to biocontainment of calf scours in the Sandhills Calving System, dairy productivity, health and mastitis.

I will contribute lectures on population medicine to graduate, professional, and undergraduate courses. I will continue to be active in 4HCCS Veterinary Science Curriculum development, Veterinary Science Design Team, Nebraska 4H Veterinary Science School Standards Curriculum, the Nebraska State Fair Birthing Pavilion and the Nebraska State Fair livestock drug testing.

NEBRASKA VETERINARY DIAGNOSTIC CENTER
DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES

David J. Steffen, Professor and Director
BS, DVM, PhD, ABVP

OVERVIEW

- The NVDC consists of the diagnostic laboratory in Lincoln. The VDC is an AAVLD provisionally accredited full service diagnostic laboratory, whose emphasis is on food animal diagnostic services and disease surveillance with as a second area of emphasis in surgical pathology. The lab maintians basic services to the poultry industry, wildlife, zoo, pet and public health interests. The laboratory also strives to meet research needs of campus and private concerns in the state with laboratory support primarily in pathology, histology and microbiology research services. The Nebraska Veterinary Diagnostic Laboratory provides a full complement of necropsy, bacteriologic, histologic, immunohistochemical, molecular diagnostic, serologic, toxicologic, electronmicroscopic and traditional virologic services.

VISION

- The vision of the Nebraska Veterinary Diagnostic Center is to enhance the economic vitality and life quality for all Nebraskans by promoting healthy livestock and companion animals, enhancing the safety of animal-derived consumer products and protecting wildlife resources through disease control and enhancing and understanding of diseases.

MISSION

- The Diagnostic Laboratory's mission is to assist veterinarians, their clients, and others responsible for animal and public health in the detection, prevention and understanding of animal diseases. Faculty and staff approach these tasks by providing accessible, accountable, timely and accurate diagnostic services and by sharing information generated through scholarly publications, meeting presentations, including direct communications.

OBJECTIVES

- Provide accessible, accountable, timely and accurate diagnostic, research and information services to veterinarians, animal owners, food producers and animal health industries.

- Provide proactive investigational support to enhance population approaches to, and efficiency of diagnostic testing.

- Implement modern current and updated biotechnology methods, where appropriate, into diagnostic services.

- Monitor and report the incidence and threat of animal diseases, as well as diseases that are transmissible from animals to humans.

- Share new information with colleagues through publication in a manner that respects the confidentiality of all clientele.

- Prioritize research activities, in applied areas, (epidemiology, diagnostic techniques and emerging diseases) and areas of current concern to Nebraska citizens.

- Improve communications and cooperation with extension, teaching and research programs throughout IANR.

- Maintain an affordable diagnostic testing program to assure sufficient case numbers in the support of disease surveillance functions with the support of international trade and have full access (tissues, field isolates etc.) to current research information and materials for accurate diagnostic testing and disease prevalance and trends.

- Improve communications with target clientele toward fulfilling their needs and providing services based on those needs.

- Communicate with clientele toward educating them on population approaches to diagnostics and current updated testing technologies.

- Assist in anyway with the National Surveillance Programs.

- Support advances in current and updated biomedical research through diagnostic services to reach a wider range of clientele in the community.

FROM THE DIRECTOR -

Since the upgrade of the HVAC system is now behind us, it has addressed the continual difficulties with temperature regulation in the labs and offices, humidity build up and the lack of capacity to install adequate numbers of chemical exhaust hoods to meet the current needs of the labs. The new HVAC system has improved the laboratory environment and the use of space heaters to operate temperature-sensitive assays in winter and we were enabled to install necessary safety hoods. This has allowed us the installation of aditional exhaused work stations. A chemical hood was installed in room 145 and two histology grossing stations were installed in room 116, one fixed and one portable. A third station was relocated from necropsy into room 116. The reassigned space adds 230 square feet of lab space and 239 square feet of office space to that operation. Histology opertions have been removed from the necropsy space. These changes have alleviated the immediate safety concerns caused by improper use of a biological safety cabinet for formalin fumes, using necropsy space for microbiology incubators and resultant increased traffic in necropsy. An office was removed from room 104 and renovations are scheduled to return that space to the original use as a clean side to the locker area.

The incinerator is a major problem area and it still burns below EPA standards for prion wastes. Prion positive tissues are currently sent out of state for confirmatory testing, which effecitvely leads to disposal of any positive materials. The need for replacement in the future of our incinerator is critical and anticipated and will be incroporated into the lab expansion requests.

In 2005, the purchase of critical equipment for VDC included an Ultrasonic Nebulizer (Cetac Tech, Inc.); Olympus IX71 Inverted Fluor Microscope (Hitschfel Instruments, Inc.); PTC-0200 DNA Engine Thermal Cycler/ALD-1244 Dual 48/48-well Alpha Block (MJ Research); BACTEC MGIT 960 Mycobacterial Detection System (Becton Dickinson & Company); Ultralow -86°C Upright Freezer (Sanyo Scientific); ICS-900 ION Chromatography System, including automated sampler and consumbles bundles (Dionex Corporation) and LEICA IPC-Modular Microscope, Projector and Camera (North Central Instruments). The purchase of this equipment has been a valuable assesst to the diagnostic center to enable faculty and staff to conduct critical diagnostic services.

Staff turnover problems have dramatically diminished. Several factors have played a role. While base salaries have not improved, supportive faculty oversight adds to staff satisfaction, and professional development opportunities are available to reward efforts and create incentives for employees to stay longer. Engagement of staff in surveillance testing programs and as involved contributors to research has also increased retention. Intermediate staff level postions were created in each of the microbiology laboratories so that opportunities for advancement exists and to remunerate the increased contribution of our senior and most skilled technical personnel. Each of these sections has multiple Research Technician III entry-level positions, one technologist position and one supervisor position, in addition to the Laboratory Manager. This will allow the opportunity for advancement for better employees and the positions pay slightly better than an entry-level position, thus, improving retention. However, this does not solve office/service salaries, which still lag behind community levels, that needs to be addressed in the future.

Congratualtions to Drs. Bruce W. Brodersen and Douglas G. Rogers who were nominees for the "Superior Academic Advising Award" from University of Nebraska-Lincoln, College of Agricultural Sciences and Natural Resources. Despite past and current personnel challenges that the diagnostic center has endured, we have across the board, dedicated faculty and staff who are doing an excellent job to assure good customer service/relations, and most importantly, accurate diagnostic testing in an overall pleasant working environment.

In conclusion, we are continuing our regular scheduled lab meetings, with minutes, throughout the year. Faculty have been engaged in extramurally funded research during 2005, one or more had referred publications. Diagnostic faculty were active in national and state meetings and several faculty were featured in the lay press related to their diagnostic and research achievements. Diagnostic Pathology and Toxicology faculty continue to engaged in undergraduate advising, pre-vet club advising, teaching and undergraduate teaching at a higher level than ever.

Specific activities of the NVDLS are summarized in the following tables.

Table 8. ACCESSIONS BY SPECIES BY MONTH (January 2005- December 2005)

NEBRASKA VETERINARY DIAGNOSTIC LABORATORY - Lincoln, Nebraska

Species	Jan.	Febr.	Mar.	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	TOTAL	% OF TOTAL
Avian - Chicken	3	4	6	3	5	3	1	0	4	3	1	1	34	0.23
Avian - Misc.	27	13	15	8	82	251	142	121	99	74	46	10	888	5.96
Avian - Turkey	1	1	1	0	1	2	1	0	1	1	3	0	12	0.08
Bovine	683	746	1091	931	785	566	466	527	564	642	657	607	8,265	55.45
Canine	194	190	263	239	199	276	210	261	209	250	229	226	2,746	18.43
Caprine	4	4	4	9	10	3	10	13	9	8	4	8	86	0.58
Equine	17	33	47	69	69	78	69	83	82	69	26	19	661	4.44
Feed & Water	1	2	1	1	1	0	1	6	5	4	1	1	24	0.16
Feline	47	57	52	40	47	49	64	52	56	76	59	52	651	4.37
Ovine	13	10	4	6	2	3	4	5	9	7	4	2	69	0.46
Porcine	60	60	57	57	53	45	38	53	43	41	58	49	614	4.12
Porcine - PRV	28	32	28	24	28	27	24	26	25	20	26	21	309	2.07
Misc. Mammal	40	29	36	30	30	47	27	35	45	53	48	35	455	3.05
Misc.	3	6	3	6	8	8	11	12	12	7	11	3	90	0.60
TOTAL	1,121	1,187	1,608	1,423	1,320	1,358	1,068	1,194	1,163	1,255	1,173	1,034	14,904	100.00

Table 9. SUMMARY OF LABORATORY PROCEDURES (January 2005 - December 2005)

NEBRASKA VETERINARY DIAGNOSTIC LABORATORY

PROCEDURE	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Necropsies	64	67	29	45	39	50	33	42	33	53	56	50	561
Histology	2,862	3,646	5,065	3,927	3,439	3,829	3,341	3,847	2,672	3,533	3,433	3,320	42,914
Bacteriology	941	1,407	2,176	1,382	1,210	813	641	775	919	1,259	1,122	1,407	14,052
PCR/RFLP/Sequencing	235	192	224	160	234	469	267	400	365	299	301	255	3,402
Mycology	7	8	10	8	7	7	8	14	14	12	2	8	105
Sensitivity Tests	136	140	223	254	171	113	154	154	167	160	199	167	2,038
FA Tests (Bact.)	2	8	2	2	4	2	0	2	1	6	3	5	37
FA Tests (Viral)	9	4	1	5	6	8	16	18	7	21	4	6	105
EM Exams	2	4	16	7	4	3	6	3	5	8	2	1	61
Toxicology	94	150	136	92	109	72	66	144	201	115	90	61	1,330
Parasitology	433	721	939	470	515	380	67	186	372	420	470	768	5,741
Clinical Pathology	11	18	13	17	16	18	21	21	18	27	12	15	207
Bacterial Serology	87	76	83	68	82	28	18	18	33	106	139	40	778
Viral Serology	2,445	2,426	2,554	4,154	3,283	2,111	2,384	2,725	2,568	3,644	3,414	2,917	35,083
Avian Serology	630	1,063	733	250	1,100	1,064	14	1,166	0	2	1,436	4	7,462
Immunohistochemistry	78	99	145	103	54	40	31	36	54	68	107	69	885
BVD Skin Biopsy	19,836	21,850	26,475	26,758	20,630	18,781	14,893	15,479	17,873	18,153	18,401	17,786	236,923
CWD	442	198	94	0	0	0	0	0	1	14	27	7,379	8,155
Virus Isolation	35	60	42	34	22	46	18	7	12	24	30	30	360
Rabies	0	0	0	0	0	0	0	0	8	26	6	2	42
BCV, BVD & Rota Elisa	101	350	280	250	101	89	24	40	49	41	30	40	1,395
Pseudorabies	785	739	874	635	721	313	432	532	535	300	368	528	6,762
TOTAL for MONTH	29,236	33,226	40,114	38,621	31,747	28,236	22,434	25,609	25,907	28,291	29,652	34,858	368,398

Table 10. Number of Accessions, Previous Five Years**

	2001	2002	2003	2004	2005
Lincoln	14,463	16,298	15,330	14,485	14,904
North Platte	650	795			
Scottsbluff	1,409	644			
TOTAL	13,525	17,737	15,330	14,485	14,904

**Totals from 2000 through 2002 included totals from the North Platte and Scottsbluff Labs (The Scottsbluff lab was closed as of June 30, 2002, and the North Platte lab was closed as of December 30, 2002, due to budget reductions).

Table 11. Number of Laboratory Procedures Conducted, Previous Five Years

	2001	2002	2003	2004	2004
Lincoln	326,288	342,634	356,129	359,907	368,398
North Platte*	7,708	8,477			
Scottsbluff*	16,452	6,276			
TOTAL	350,448	357,387	356,129	359,907	368,398

*North Platte and Scottsbluff totals include referral testing that was sent to the Lincoln laboratory (Also see note above in regard to closing of Scottsbluff and North Platte labs).

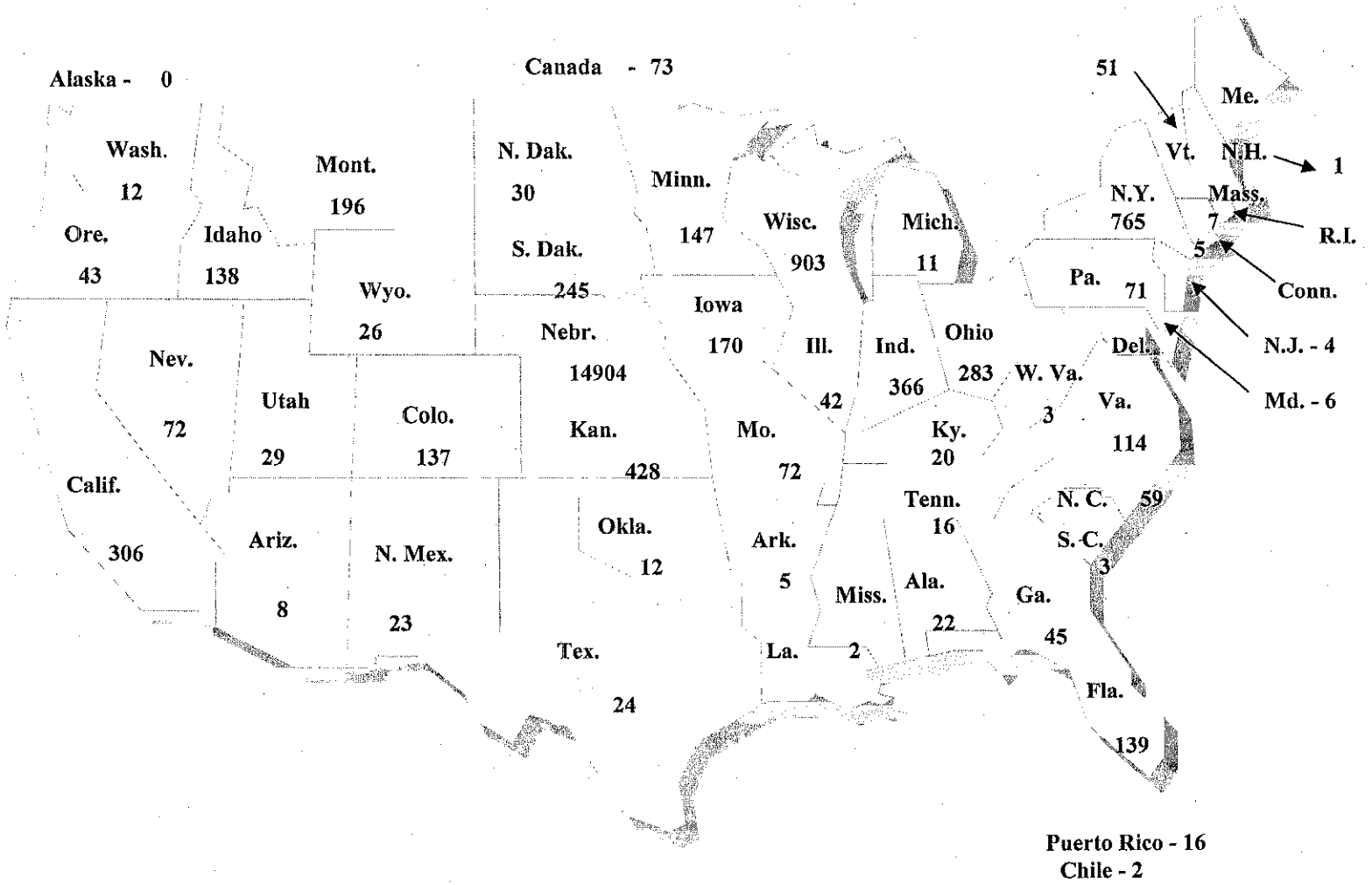
Table 12. ANNUAL REPORT - LAG TIME REPORT

Veterinary Diagnostic Center

January 1, 2005 - December 31, 2005

Number of Days to Report	All Accessions % Reported (Cumulative %)				Normal Accessions % Reported (Cumulative %)				Pseudorabies Accessions % Reported (Cumulative %)			
	First Report		Final Report		First Report		Final Report		First Report		Final Report	
	Given	%	Sent	%	Given	%	Sent	%	Given	%	Sent	%
0	1.5	1.5	1.5	1.5	1.1	1.1	1.1	1.1	20.1	20.1	20.1	20.1
1	12.8	14.3	12.5	14.0	12.5	13.6	12.2	13.3	26.0	46.1	26.3	46.1
2	11.1	25.4	11.2	25.2	11.0	24.7	11.1	24.4	13.0	59.1	13.0	59.1
3	12.9	38.3	12.8	38.0	13.0	37.6	12.9	37.3	9.4	68.5	9.4	68.5
4	9.0	47.2	9.0	46.9	8.9	46.6	9.0	46.3	10.7	79.2	10.7	79.2
5	13.6	60.8	13.4	60.4	13.6	60.2	13.5	59.8	9.4	88.6	9.4	88.6
6	13.3	74.1	13.6	73.9	13.5	73.7	13.7	73.5	5.2	93.8	5.2	93.8
7	9.1	83.2	9.1	83.1	9.2	82.9	9.3	82.8	1.9	95.8	1.9	95.8
8	5.2	88.4	5.2	88.3	5.3	88.3	5.3	88.1	0.3	96.1	0.3	96.1
9	2.5	90.9	2.5	90.8	2.5	90.8	2.5	90.6	0.6	96.8	0.6	96.8
10	1.7	92.6	1.7	92.4	1.7	92.5	1.7	92.3	0.3	97.1	0.3	97.1
11-15	4.1	96.7	4.2	96.6	4.1	96.6	4.2	96.6	1.3	98.4	1.3	98.4
16-20	1.1	97.7	1.1	97.7	1.1	97.7	1.1	97.7	0.3	98.7	0.3	98.7
21-30	0.8	98.5	0.8	98.5	0.8	98.5	0.8	98.5	00	00	00	00
31-50	0.5	99.0	0.5	99.0	0.5	99.0	0.5	99.0	0.3	99.0	0.3	99.0
Over 50	1.0	100.0	1.0	100.0	1.0	100.0	1.0	100.0	1.0	100.0	1.0	100.0

NOTE: Weekends and holidays are included in this report. If a case is not called or FAXed out, it will have no record of a first report date.
Research cases may or may not have a first and final report date.



Distribution of Accessions by State

NVDLS

January 2005 - December 2005

Fig. 1

Distribution of Accessions by County - NVDLS

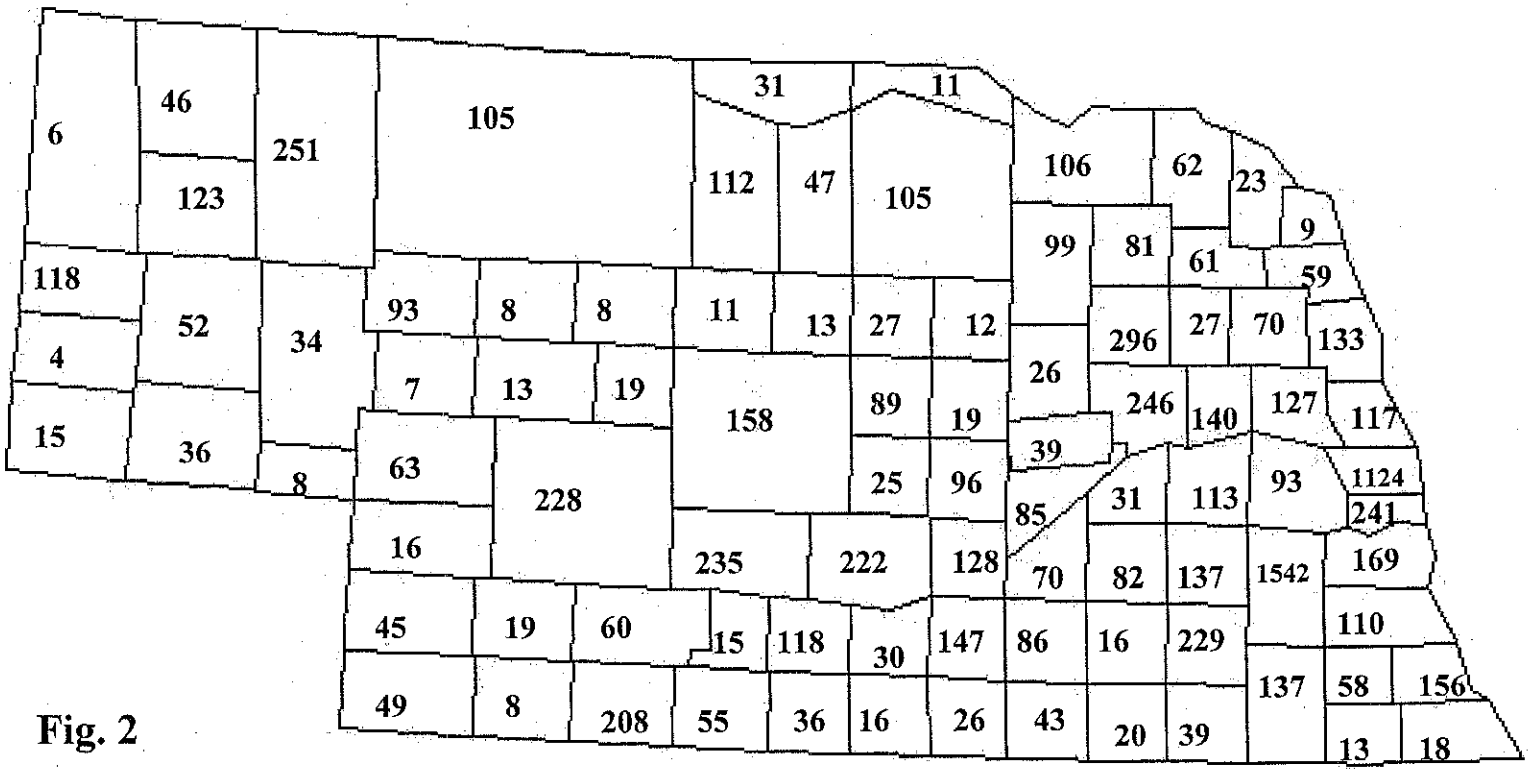


Fig. 2

January 2005 - December 2005

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
2005 GRANTS AND CONTRACATS PROGRAM

GRANTS AND CONTRACTS FUNDED IN 2005

A Mouse Model for Studying Candidiasis
Duhamel GE and KW Nickerson. 2005. Interdisciplinary Research, UNL Research Council, $20,000

Bovine Viral Diarrhea Virus in North American Alpaca Herds
Kelling CL, BW Brodersen, DR Smith and DJ Steffen. 2005. Alpaca Research Foundation, $23,400

Bovine Genetics Quality Assurance
Steffen DJ. 2005. National Association of Animal Breeders, $12,000

Bovine Viral Diarrhea Virus in North American Alpaca Herds; Prevalence and Implementation of Control Strategies
Kelling CL, DR Smith, DJ Steffen and BW Brodersen. 2005. Alpaca Research Foundation, $23,400

Chronic Wasting Disease Surveillance in Deer
Steffen DJ. 2005. Nebraska Game and Parks Commission, $132,000

Classic Swine Fever Surveillance Testing
Steffen DJ. 2005. Cooperative Agreement. United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Classic Swine Fever (CSF), $86,175

Development and Validation of a System to Utilize Liquid Culture Media for Johne's Disease Fecal Culturing in Nebraska
Steffen DJ. 2005. Nebraska Department of Agriculture, Johne's Disease Program #18-05-121, $53,000

Effect of Vaccinating Against Type III Secretory Proteins of *Escherichia coli* O157:H7 on the Occurrence of *E. coli* O157:H7 on Hides Pre- and Post-Harvest
Klopfenstein TJ, RE Peterson, DR Smith, GE Erickson, RA Moxley and S Hinkley. 2005. National Cattlemen's Beef Association, $42,525

Experimental Evaluation of Efficacy of Commercially Available PRRSV Vaccines
Osorio FA. 2005. SYVA labs (Spain) $45,502

Functional Analysis of bICP0, a BHV-1 Gene that is a Promiscuous Trans-Activator
Griffin DD. 2005. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $350,000

Genetic Basis of Resistance to Food-Borne Bacterial Pathogens
Duhamel GE and JS Weber. 2005. Institute of Agriculture and Natural Resources (IANR), Interdisciplinary Research Program, United States Department of Agriculture (USDA), Cooperative States Research, Education, and Extension Service (CSREES), NEB 14-137, $40,000

Genetic Disease Research
Steffen DJ. 2005. American Simmental Association (ASA), $2,500

***Helicobacter*-Associated Colitis of *Callitichidae* Kept in Zoo Exhibits**
Duhamel GE, DL Armstrong, LJ Lowenstein, BA Rideout and DJ Steffen. 2005. Morris Animal Foundation, Project #D05ZOO-007, $29,948

***Helicobacter*-Associated Colitis of *Callitrichidae* Kept in Zoo Exhibits**
Duhamel GE. 2005. Morris Animal Foundation, $30,212

Herd Immunity -Vaccination Against *E. coli* O157:H7
Klopfenstein TJ, DR Smith, GE Erickson and RA Moxley. 2005. Nebraska Beef Council, $50,000

Johne's Disease Herd Testing
Steffen DJ. 2005. Nebraska Department of Agriculture, Johne's Disease Program, Project #18-05-107, $80,000

Polymicrobial Associations in Inflammatory Bowel Disease
Duhamel GE. 2005. National Institute of Health (NIH), National Institute of Allergy and Infectious Diseases (NIAID), $141,768

Proline Metabolism and Redox Homeostasis in Gastrointestinal Bacterial Diseases
Duhamel GE and DF Becker. 2005. University of Nebraska, Layman Award, $10,000

Rational Design of a New Generation of PRRSV Differential (Marker) Vaccines
Osorio FA and AK Pattnaik. 2005. National Pork Board, $150,000

Stability of the LR Mutant Virus in Calves
Griffin DD. 2005. Fort Dodge Animal Health; $60,000

Stimulating the Development of Veterinarians to Serve Rural America
Griffin DD and GP Rupp. 2005. United States Department of Agriculture (USDA), Cooperative State Research, Education and Extension Service (CSREES), $124,810

Use of a Green-Fluorescent Protein-Expressing Strain of Porcine Reproductive and Respiratory Syndrome Virus for the Study of PRRSV Pathogenesis and *In Vivo* Tropism

Osorio FA and AK Pattnaik. 2005. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), Project #2005-01810, $129,600

West Nile Virus Testing

Steffen DJ. 2005. Nebraska Health and Human Services, West Nile Virus Surveillance Program, $15,000

COOPERATIVE EXTENSION DIVISION (CED) GRANT

Beef Feedlot Cowboy Training Modules

Levis DG, KP Anderson, M Stauffer, AR Wohlers, DD Griffin, DA Lienemann, GE Erickson, TL Mader, IG Rush and DR Smith. 2005. University of Nebraska-Lincoln, Cooperative Extension Division (CED), $6,000

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES (IANR) EQUIPMENT GRANT

Shared Microwave Digester

Carlson MP and DD Snow. 2005. Institute for Agriculture and Natural Resources, $12,000

INCOME GRANT

International Reference Laboratory for *Spirochetal Colitis* Research

Duhamel GE. 2005. University, Industry and Practitioners, $535

STATE GRANT

Effects of CLA on Fat Metabolism in Mice

Fromm M, J Miner and AR Doster. 2005. University of Nebraska-Lincoln, Center for Biotechnology, Lincoln, Nebraska, $25,000

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES (IANR) TRAVEL GRANT

Annual Meeting of the American College of Veterinary Pathologists (ACVP)

GE Duhamel. 2005. Institute of Agriculture and Natural Resources (IANR), Research Travel Grant, Boston, MA, $500

UNDERGRADUATE PROGRAM GRANTS

Howard Hughes Medical Institute Fellowship for Summer Undergraduate Research

Duhamel GE. 2005. Nebraska Wesleyan University, Senior Undergraduate Project, $2,500

Influence of N-linked Glycans on Bovine Respiratory Syncytial Virus Attachment (G) Glycoprotein Expression

Kelling CL. 2005. University of Nebraska-Lincoln, Undergraduate Creative Activities and Research Experiences Program (UCARE). Undergraduate Student Research Program, Holly Samson, $2,500

Undergraduate Creative Activities and Research Experiences Program (UCARE)

Duhamel GE. 2005. Undergraduate Student Project, $4,000

ACTIVE GRANTS AND CONTRACTS CONTINUED FROM PREVIOUS YEARS

A Program to Ensure the Future Supply of Well Trained Rural Veterinarians to Provide Public Health, Homeland Security, Food Safety and Veterinary Services to Rural America

DD Griffin, GP Rupp, AM O'Connor and LC Hollis. 2005. United States Department of Agriculture (USDA), Cooperative State Research, Education and Extension Service (CSREES), $124,810

Analyses of Virulence and Attenuation Determinants of Porcine Reproductive and Respiratory Syndrome Virus Using Reverse Genetics Approach

Pattnaik AK and FA Osorio. 2004-2007. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $320,000

Analysis of BHV-1 Present in Aborted Fetuses

Jones, CJ. 2004-2006. Pfizer Animal Health, $60,000

Assessment of Health and Reproductive Status of River Otter in Nebraska

Steffen DJ, Carlson MP and Rogers DG. 2003-2005. Nebraska Game and Park's Commission, $12,400

Bovine Genetics Quality Assurance

Steffen DJ. 2004-2005. National Association of Animal Breeders, $12,000

Competitive Exclusion as an *E. coli* O157:H7 Intervention Strategy (phase II study)

Klopfenstein TJ, Smith DR, Moxley RA, Erickson and Hinkley S. 2004. Nutrition Physiology Corp., $100,000

Effect of Vaccinating Against Type III Secretory Proteins of *Escherichia coli* O157:H7 on the Occurrence of *E. coli* O157:H7 on Hides Pre- and Post-Harvest

Klopfenstein TJ, Peterson RE, Smith DR, Erickson GE, Moxley RA and Hinkley S. 2005. National Cattlemen's Beef Association, $42,525

Evaluation of Commercially Available Serologic Marker Systems for Foot and Mouth Disease

Banerjee, R and MF Lou. 2002-2007. National Institute of Health (NIH), Redox Biology Center Cobra Grant, $8,269,843

Functional Genomic Analysis of Bovine Viral Diarrhea Virus

Donis R and CL Kelling. 2004. United States Department of Agriculture (USDA), National Research Initiative Grant (NRIG), $275,000

Functional Genomic Analysis of Mycobacterium Paratuberculosis

JP Bannantine (National Animal Disease Center); V Kapur (University of Minnesota); SJ Wells (University of Minnesota); RG Barletta and JR Stabel (National Animal Disease Center). 2003-2005. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $285,000

Functional Analysis of bICP0, a BHV-1 Gene that is a Promiscuous Trans-Activator

Jones CJ. 2002-2005. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NCRICGP), $300,000

Identification and Characterization of PRRSV Immunogenic Subunits Using Viral Vectors

Pattnaik AK. 2004-2005. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP) (NC-229), $60,304

Induction of Protective Immunity Against Systemic BVDV1 and BVDV2 Infection

Kelling CL and DJ Steffen. 2005. Schering-Plough Animal Health, $144,000

Integrated Control and Elimination of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) in the U.S.: Viral Vectors to Assess PRRSV Immunogenic Subunits

M Murtaugh, FA Osorio, AK Pattnaik, S Chowdhury and C Gaignon. 2004-2005. National Research Initiative Competitive Grants Program (NRICGP); United States Department of Agriculture (USDA), Integrative Program, $4.4 million/$21,917,000

Integrating Biosecurity Practices into Livestock Production Management on Farms and Ranches to Ensure a Sustainable and Wholesome Food Supply

Rupp G, Griffin DD, Hungerford LL, AM O'Connor, PJ Chenoweth and Smith DR. 2002-2005. United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Serivee (CSREES), Higher Education Challenge Grant, $249,792

Intervention Strategies to Reduce *Escherichia coli O157:H7* in Beef Feedyards

Smith DR, Erickson GE, Moxley RA, Klopfenstein TJ and Hinkley S. 2006. United States Department of Agriculture (USDA), Cooperative State Research, Education and Extension Service (CSREES), National Integrated Food Safety Initiative, Cooperative Grants Program (CGP), $500,000

Johne's Integrated Program in Research, Education and Extension

V Kapur, et al. and RG Barletta. 2004-2006. United States Department of Agriculture (USDDA), National Research Initiative Integrated Program (NRIIP), Johne's Disease Integrated Program (JDIP); UNL-Subcontract, $51,122

Johne's Disease Herd Testing

Steffen DJ. 2004-2005. Nebraska Department of Agriculture, $60,000

Measure Incidence of *E. coli O157:H7* in Beef Cattle Vaccinated at Ranch or at Feedlot

Terry Klopfenstein, Galen Erickson, Rodney Moxley, David Smith and Susanne Hinkley. 2004-2005, Montana State University, $122,378

Molecular Analysis of a Mycobacterium Paratuberculosis Colony-morphology Attenuated Mutant

Barletta, RG and CJ Czuprynski. 2004-2006. United States Department of Agriculture, National Research Initiative Competitive Grant Program, Sustaining Animal Health and Well Being, $270,000

NBD Peptides in MPTP Mouse Model

K Pahan, Michael J Fox and Y Zhou. 2004-2006. Foundation for Parkinson's Research, 3% effort

Nebraska Center for Viral Pathogenesis

Zhou Y and C Wood. 2005-2010. National Center for Research Resources (NCRR), National Institute of Health (NIH), Microscopy Core Facility Support, 5% effort

Protein-thiol Mixed Disulfides in Cataractogenesis

Lou MF. 2003-2007. National Institute of Health (NIH), $1,794,300

Rational Design of a New Generation of PRRSV Differential (Marker) Vaccines

Osorio, FA and AK Pattnaik. 2004-2005. National Pork Board, $145,000

Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1 (BHV-1) Latency Related Gene

Jones, CJ. 2003-2006. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $320,000

Role of Non-Structural Proteins in Pestivirus Assembly

Donis R and CL Kelling. 2004. National Institute of Health (NIH), $289,116

Role of Hyaluronan Matrix in Prostate Cancer Progression

MA Simpson and Y Zhou. 2005-2010. National Institute of Health (NIH) National Cancer Institute (NCI), 6% effort

Scrapie Testing

Brodersen, BW. 2005. United States Department of Agriculture, competitive contract award for scrapie testing, 1,210 tests; 10,000/year

Sub-typing of PRRSV Isolates by Means of Measurement of Cross-Neutralization Reactions

Osorio, FA. 2004-2005. National Pork Board, $42,000

Vaccination as an *E. coli O157:H7* Intervention Strategy - (phase II study)

Moxley RA, Klopfenstein TJ, Smith DR, Erickson GE and Hinkley S. 2005. Bioniche Life Sciences, Inc., $152,790

Validation of Test Methods Needed to Evaluate Intervention Strategies for *Escherichia coli O157:H7* Intestinal Colonization and Fecal Shedding in Feedlot Cattle

Moxley RA. Hinkley S, Smith DR, Erickson GE and Klopfenstein TJ. 2005. Nebraska Beef Council, $45,080

Viral Pathogens that Contribute to Respiratory Disease Complex in Cattle: Epidemiology of Persistent BVDV Infections

Brodersen BW. 2005-2006 United States Department of Agriculture (USDA), Agriculture Research Service (ARS), $25,000

Viral Pathogenesis

Jones, CJ. 2000-2005. National Institute of Health (NIH), Centers of Biomedical Research Excellence (COBRE), $10,400,000

Vitamin-Dependent Modifications of Histones

Janos Zempleni and Marjorie F. Lou. 2003-2007. National Institute of Health (NIH), $1,087,586

VSV RNA Transcription and Replication

Pattnaik, AK. 2001-2006. National Institute of Allergy and Infectious Diseases (NIAID), National Institute of Health (NIH), $1,454,920

INDUSTRY GRANTS

Porcine Reproductive and Respiratory Syndrome (PRRS): Methods of the Integrated Control, Prevention, and Elimination of PRRS in United States Swine Herds

Osorio FA, R Johnson, J Weber, AR Doster and AK Pattnaik. 2003-2005. United States Department of Agriculture (USDA), Cooperative State Research, Education and Extension Service (CSREES), Multi-state project NC-229, $25,000

GENERATED REVENUES

Income from International Reference Laboratories for Spirochetal Colitis Research

GE Duhamel. 1995-2005. Funds received through Universities, Industries and Practitioners, $25,240

GRANT PROPOSALS SUBMITTED IN 2005

A Nebraska Center for Bacterial Pathogenesis Research
Somerville, GA. 2005. Nebraska Research Initiative, $240,000

A Exploiting Staphylococcal Metabolism to Prevent Biofilm Associated Heart Infections
Somerville, GA. 2005. American Heart Association, Scientist Development Grant, $236,000

A Tricarboxylic acid Cycle-Dependent Environmental Regulation of Staphylococcus Epidermidis Polysaccharide Intercellular Adhesin Production
Somerville, GA. 2005. University of Nebraska Foundation, Layman Award, $7,839

An Accurate Determination of the Proportion of Beef Cattle Herds with Johne's Disease: Part II, Herd-level Sensitivity and True Prevalence
Smith DR. 2005. United States Department of Agriculture (USDA), Veterinary Services, $213,667

Beef Feedlot Cowboy Training Modules
Levis DG, Anderson KP, Stauffer M, Wohlers AR, Griffin DD, Lienemann DA, Erickson GE, Mader TL, Rush IG and Smith DR. 2006. University of Nebraska-Extension, $6,000

Causes of Human *E. coli* O157:H7 Illness From All Food and Non-Food Vectors
Lehenbauer TW, Bradley KK, Smith DR and Morgan JB. 2005. American Meat Institute, $20,000

Characterization of the Role of Spiral Bacteria in Gastrointestinal Disease of California Sea Lions
Duhamel GE and Frances MD Gulland. 2005. Oiled Wildlife Care Network, (not funded), $10,000

Does the HSV-1 Latency Associated Transcript (LAT) Encode a Protein?
Jones CJ. 2001-2008. National Institute of Health (NIH), $401,500

Effect of Vaccinating Against Type III Secretory Proteins of *Escherichia coli* O157:H7 on the Occurrence of *E. coli* O157:H7 on Hides Pre- and Post-Harvest
Klopfenstein TJ, Peterson RE, Smith DR, Erickson GE, Moxley RA and Hinkley S. National Cattlemen's Beef Association, $42,525

Electroneedle Biosensor Platform for Bioagent Detection
Oberst R, Brozik 0S, DeBey B, Flemming J, Kapil S, Kelling CL, Rowland R and Walz P. 2005. Midwest Research Center of Excellence, Washington University, $73,000

Enhancement of Efficacy of PRRSV Vaccines by Altering the Glycosylation Pattern of Viral Glycoproteins

Pattnaik AK and FA Osorio. 2006. National Pork Board, $83,000

Functional Analysis of Small RNAs Encoded by the HSV-1 LAT Gene

Jones CJ. 2006-2011. National Institute of Health (NIH) $1,800,00

Functional Tissue Engineering of Articular Cartilage

Subramanian A, Larsen G, Steffen DJ and Turner J. 2005. National Institute of Health (NIH), $1,400,000

Functional Genomics of Mycobacterium Paratuberculosis

Barletta RG, LE Bermudez (Oregon State University) and AM Talaat (University of Wisconsin). 2006-2008. United States Department of Agriculture (USDA, National Research Initiative Competitive Grants Program (NRICGP), $999,074

Herd Immunity -Vaccination Against *E. coli* O157:H7

Klopfenstein TJ, Smith DR, Erickson GE and Moxley RA. 2005. Nebraska Beef Council, $50,000

Integrating Biosecurity Practices into Livestock Production Management on Farms and Ranches to Insure a Sustainable and Wholesome Food Supply

Rupp GP, DD Griffin AM O'Connor and PJ Chenoweth. 2002. United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service (CSREES), $249,792

Johne's Integrated Program in Research, Education, and Extension

Kapur V (University of Minnesota) et al., RG Barletta. 2006-2007. United States Department of Agriculture, Johne's Disease Integrated Program (JDIP), National Research Initiative Integrated Program (NRIIP), $231,141

***Mycobacterium avium* subsp. Paratuberculosis Pathogenesis**

Bermudez LE (Oregon State University) and RG Barletta. 2006-2008. United States Department of Agriculure (USDA), National Research Initiative Competitive Grants Program (NRCGP), Animal Protection; Animal Disease, $378,571/$159,574

Non-Antibiotic Small Molecule Therapeutics: Broad-Spectrum Non-Antibiotic Countermeasures for Bacterial Pathogens

Powers R, RG Barletta and J Takacs. Internal Pre-proposal. Department of Defense, in Progress

Program to Ensure the Future Supply of Well Trained Rural Veterinarians to Provide Public Health, Homeland Security, Food Safety, and Veterinary Services to Rural America

Griffin DD, GP Rupp, AM O'Connor and LC Hollis. 2005. United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service (CSREES), $124,810

Rational Design of a New Generation of PRRSV Differential (Marker)
Osorio FA and AK Pattnaik. 2005. National Pork Board/Vaccines, $150,000

Reverse Genetics Approach to Functional Analyses of Bovine Respiratory Syncytial Virus Fusion Protein Glycosylation
Kelling CL, CL Toplff and DJ Steffen. 2005. United States Department of Agriculture (USDA), National Research Initiative (NRI), $345,570

Spontaneous *Brachyspira* and *Helicobacter* Colonic Infections in Captive Rhesus Macaques
Duhamel GE and Karol Sestak. 2005. Tulane National Primate Research Center, (not funded), $50,000

Universal Screen for Protein-Ligand Binding
Somerville, GA. 2005. National Institutes of Health, $927,533

Use of a Green-Fluorescent Protein-Expressing Strain of Porcine Reproductive and Respiratory Syndrome Virus for the Study of PRRSV Pathogenesis and *In Vivo* Tropism
Osorio FA and AK Pattnaik. 2005. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP),$129,600

FOUNDATION GRANT

Bovine Viral Diarrhea Virus in North American Alpaca Herds
Kelling CL, Brodersen BW Smith DR and Steffen DJ. 2005. Alpaca Research Foundation, $23,400

Helicobacter-Associated Colitis of Callitichidae Kept in Zoo
Duhamel GE, Armstrong DL, Lowenstein LJ, Rideout BA and Steffen DJ. 2005-2006. Morris Animal Foundation, $29,948

FIVE-YEAR RECORD OF GRANTS AND CONTRACTS

Prevalence of Bacterial Pathogens in Porcine Diarrhea Complex
Duhamel GE. 1998-2000. Alpharma, $10,940

A Novel Strategy to Test and Monitor Beef Feedlot Food-Safety Control Points
Smith DR, Hungerford LL, Gray JT, Moxley RA, Klopfenstein TJ and Milton CT. 2000-2004. United States Department of Agriculture (USDA), Competitive Research Grant's Office (CRGO) Project #NEB-14-111, $953,735

A Plan for Obtaining More Accurate and Specific Results on PRRSV Serological Tests When Using Commercial ELISAs
Osorio FA. 2001-2002. National Pork Producer's Council, $15,000

A New Approach to Control of Human Pathogenic Fungi: Investigation of Farnesol and Farnesol Analogs in a Mouse Model
Duhamel GE and KW Nickerson. 2001-2004. Tabacco Settlement Biomedical Research Enhancement Fund Research, Seed Grant Program, $45,000

An Accurate Determination of the Proportion of Beef Cattle with Johne's Disease and the Factors Explaining Herd Status
Smith DR. 2003-2004. United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), VS Johnes Disease Cooperative Agreement, $100,000

Analyses of Virulence and Attenuation Determinants of Porcine Reproductive and Respiratory Syndrome Virus Using Reverse Genetics Approach
Pattnaik AK. 2004-2007. United States Department of Agriculture (USDA), National Research Institute Competitive Grants Program (NRICGP), $320,000

Analysis of Apoptosis and Pathogenesis by Bovine Herpesvirus 1 and bICP0
Jones CJ. 1998-2001. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $178,338

Analysis of Apoptosis and Pathogenesis by Bovine Herpesvirus 1 and bICPO
Jones CJ and AR Doster. 1998-2001. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), $178,338

Animal Model of Transmissible Neurofibromas
Schmale M and AK Pattnaik. 2002-2005. National Institutes of Health (NIH), $574,000

Challenge Model Evaluation of Direct and Indirect Exposure to *Brachyspira pilosicoli* and Interaction with Diet
Duhamel GE. 1999-2000. Novartis Animal Health, Inc, $86,400

Characterization of Group A Bovine Rotavirus Strain B641
Duhamel GE. 2002. ImmuCell, Portland, ME, $5,000

Cloning and Partial Sequencing of the 5'UTR of BVDV Isolates
Kelling CL. 2000. BioCor Animal Health Corp, $6,667

Competitive Exclusion as an *E. coli* O157:H7 Intervention Strategy, phase II study
Klopfenstein TJ, Smith DR, Moxley RA, Erickson and Hinkley S. 2004. Nutrition Physiology Corp, $100,000

Competitive Exclusion as an *E. coli* O157:H7 Intervention Strategy, phase II
Klopfenstein TJ, Smith DR, Moxley RA, Erickson and Hinkley S. 2003. Nutrition Physiology Corp, $50,000

Cross-Reactivity of Antibody Response to Genotype 1 and 2 BVDV Following Challenge Exposure of Vaccinated Calves
Kelling CL. 2000. Schering-Plough Animal Health Corp, $7,500

Distribution of *Brachyspira pilosicoli* Attachment Phenotypes Among Pigs of Three Breeds
Duhamel GE. 2002. Novartis Animal Health, Inc, $12,450

Effect of Virus Infection on Cellular Glutathione Concentration
Brink DR, Matulka L, Kelling CL and Srikumaran S. 2002-2003. Institute of Agriculture and Natural Resources (IANR), Agriculture Research Division (ARD), Interdisciplinary Research Grant Proposal, $20,000

Effect of PRRSV on the Immune System During Acute and Persistent Infections
Osorio FA, F Zuckermann and AR Doster. 1999-2001. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), $150,000

Effect of Vaccinating Against Type III Secretory Proteins of *Escherichia coli* O157:H7 on the Occurrence of *E. coli* O157:H7
Klopfenstein TJ, Peterson RE, Smith DR, Erickson GE, Moxley RA and Hinkley S. 2004-2005. National Cattleman's Beef Association, $42,525

Efficacy of Valnemulin Hydrochloride Provided In-feed for the Control of Porcine Colonic Spirochetosis Utilizing a *Brachyspira pilosicoli* Challenge Model
Duhamel GE. 2001. Novartis Animal Health, Inc, $71,420

Efficacy of Recombinant Bovine Adenovirus Expressing BVDV gp53 Gene Against Virulent BVDV Challenge
Kelling CL. 2000. Schering-Plough Animal Health Corp, $50,736

Epidemiological Aspects of Combining *E. coli O157:H7* Control Programs and Feedlot Performance

Sargeant JM, MW Sanderson, GL Stokka, DD Griffin and RA Smith. 2000. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $231,483

Evaluation of Intervention Strategies to Reduce the Prevalence of Fecal Shedding of *E. coli O157:H7*

Smith DR, Klopfenstein TJ, Moxley RA, Hungerford LL and Hinkley S. 2001-2002. Nebraska Beef Council, $100,000

Evaluation of a Competitive Exclusion Product to Reduce the Prevalence of Fecal Shedding of *E. coli O157:H7*

Klopfenstein TJ, Smith DR, Moxley RA, Hungerford LL and Hinkley S. 2001-2002. Nutrition Physiology Corp, $50,000

Field Research to Identify Risk factors for the Occurrence of *Escherichia coli* in Cattle Feedlots

Smith DR, Moxley RA and Klopfenstein TJ. 2001-2002. Alcohol Tax (LB1206) Appropriations Grant, $100,000

Genetic Elements Controlling Bovine Viral Diarrhea Virus Translation

Donis RO and CL Kelling. 1999. United States Department of Agriculture (USDA), National Research Initiative Grant (NRIG), $180,000

Gp96 as a Molecular Chaperone for Antigen Delivery in Viral Systems

Srikumaran S and CL Kelling. 2000. United States Department of Agriculture (USDA), National Research Initiative Grant (NRIG), $200,000

Group A Bovine Rotavirus: Characterization of Challenge Materials and Reference Strains

Duhamel GE. 2003-2004. Novartis Animal Health Vaccines, Inc, $19,854

Herd Immunity -Vaccination Against *E. coli* O157:H7

Klopfenstein TJ, Smith DR, Erickson GE and Moxley RA. 2005. Nebraska Beef Council, $50,000

Identification and Characterization of *Mycobacterium* paratuberculosis Virulence Genes Expressed *in vivo* by Negative Selection

Shpigel NY, I Rosenshine, M Chaffer and RG Barletta. 2003-2004. United States Department of Agriculture (USDA), Binational Agricultural Research and Development Fund, $ 100,000

Identification and Characterization of Cellular Apoptosis-Induced Proteins by Proteomics and Protein Chip Technologies

Jones CJ. 2001-2003. University of Nebraska-Lincoln, Tobacco Settlement Biomedical Research Enhancement, Strategic Areas Research Grant, $198,750

Identification and Characterization of PRRSV Immunogenic Subunits Using Viral Vectors

Pattnaik, AK. 2004-2005. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), Multi-State Project NC-229, $60,304

Identification of *Mycobacterium* paratuberculosis Virulence Determinants

Barletta RG and CJ Czuprynski (University of Wisconsin). 1999-2002. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), Sustaining Animal Health and Well Being, $210,000

Immunochromatographic Strip Assays for Detection of Bovine Group A Rotaviruses and Coronavirus

Duhamel GE. 2002. Quel Lab Inc, $4,750

Improved Detection of *Brachyspira* (formerly *Serpulina)* by PCR

Duhamel GE. 1996-2000. Boehringer Ingelheim Vetmedica, Inc, $36,000

Inhibition of Apoptosis by the Bovine Herpesvirus 1 Latency Related Gene

Jones CJ and AR Doster. 2000-2003. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), $292,000

Inhibition of Apoptosis by the Bovine Herpesvirus 1 (BHV-1) Latency Related Gene Products

Jones CJ. 2000-2003. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $292,000

Integrating Biosecurity Practices Into Livestock Production Management on Farms and Ranches to Ensure a Sustainable and Wholesome Food Supply

Rupp G, Griffin DD, Hungerford LL and Smith DR. 2004-2005. United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service (CSREES), Higher Education Challenge Grant, $249,792

Intervention Strategies to Reduce *Escherichia coli O157:H7* in Beef Feedyards

Smith DR, Erickson GE, Moxley RA, Klopfenstein TJ and Hinkley S. 2003-2006. United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service (CSREES), National Integrated Food Safety Initiative Cooperative Grant Program (NIFSICGP), $500,000

Isolation and Characterization of *Mycobacteriophages*

Barletta RG. 2001-2002. California Pacific Medical Center Research Institute, Subcontract to Phage Therapeutics, Inc, Bothell, WA, $69,495

Laboratory Diagnostic Investigations of Enteric Bacterial Diseases of Grower Pigs
Duhamel GE. 2000-2002. Novartis Animal Health, Inc, $5,840

Limiting Starch in the Diet
Klopfenstein TJ, Moxley RA, Milton CT, Smith DR, Hungerford LL and Gray JT. 2000-2001. Nebraska Beef Council, $16,700

Macrophage Cell-Lines for *in vitro* Propagation of Porcine Reproductive and Respiratory Syndrome Virus
Srikumaran S and AK Pattnaik. 2004. National Pork Board, $100,000

Measure Incidence of *E. coli O157:H7* in Beef Cattle Vaccinated at Ranch or at Feedlot
Klopfenstein TJ, G Erickson, RA Moxley, DR Smith and S Hinkley. 2004-2005. Montana State University, $122,378

Minimum Inhibitory Concentration Susceptibility Tests of Swine Isolates of *Brachyspira pilosicoli*
Duhamel GE. 1999-2001. Novartis Animal Health, Inc, $8,750

Minimum Inhibitory Concentration Susceptibility Testing of Swine Isolates of *Brachyspira pilosicoli*
Duhamel GE. 2004. Novartis Animal Health, Inc, $11,500

Molecular Characterization and Pathogenesis of *Francisella tularensis*
Duhamel GE. 2002-2004. University of Nebraska-Lincoln, University of Nebraska Medical Center, Research Collaboration Grant Program, $218,000

Molecular Characterization and Pathogenesis of *Francisella tularensis*
Meagher M, S Hinrich, P Fey, T Jerrell, P Iwen, A Benson, RG Barletta, JD Cirillo, GE Duhamel and M Griep. 2002-2003. University of Nebraska Medical Center (UNMC), University of Nebraska-Lincoln (UNL), Interdisciplinary Research, $100,000

***Mycobacterial* Drug Resistance**
Barletta RG. 1995-2004. Research in Microbiology Immunology and Infectious Diseases Foundation, Medical Research Institute of San Francisco at California Pacific Medical Center, Kuzell Institute for Arthritis and Infectious Diseases, $4,500

Optimizing Collection and Transportation of *E. coli*
Smith DR, Gray JT, Hungerford LL, Klopfenstein TJ, Moxley RA, and Milton CT. 2000-2001. Nebraska Beef Council, $22,940

Plant Endophytic Bacteria
Vidaver AK and RG Barletta. 2001-2002. Kamterter, Inc. $36,000

Production and Characterization of Bovine Group A Rotavirus and Coronavirus Challenge Material in Gnotobiotic Calves

Duhamel GE. 1998-2002. Grand Laboratories, Inc., $65,314

Production of Mouse x Porcine Neutralizing Antibodies Anti Porcine Reproductive and Respiratory Syndrome Virus

Osorio FA. 2002-2004. Sygen International, $74,755

Production and Characterization of Group A Bovine Rotavirus Challenge Material in Gnotobiotic Calves

Duhamel GE. 2004. Novartis Animal Health, Inc,Vaccines, $6,000

Protective Immunity Against PRRSV Obtained by Passive Administration of Antibodies: Optimization of the Conditions

Osorio, FA. 2002-2004. National Pork Producers Council, $25,000

Protein-Thiol Mixed Disulfides in Cataractogenesis

Lou MF. 1999-2003. National Institute of Health (NIH), $1,286,072

Protein-Thiol Mixed Disulfides in Cataractogenesis

Lou MF. 2003-2007. National Institute of Health (NIH), $1,794,300

Rational Design of a New Generation of PRRSV Differential (Marker) Vaccines

Osorio FA and Pattnaik AK. 2005-2006. National Pork Board, $150,000

Rational Design of a New Generation of PRRSV Differential (Marker) Vaccines

Osorio FA and AK Pattnaik. 2004-2005. National Pork Board, $145,000

Removal of Starch From the Diet

Klopfenstein TJ, Moxley RA, Milton CT, Smith DR, Hungerford LL and Gray JT. 2000-2001. Nebraska Beef Council, $33,400

Replication of Genomic Analogs of HCV in Transfected Cells

Pattnaik, AK. 2001-2002. Eli Lilly and Co, $149,000

Role of Macrophages in the Pathogenesis of Porcine Colonic Spirochetosis

Duhamel GE and JD Cirillo. 2000-2004. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), Animal Health and Well-Being, $240,000

Role of *E. coli* Heat-labile Enterotoxin-I in Diarrhea and Septicemia in Swine

Moxley RA and RG Barletta. 1998-2003. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), Sustaining Animal Health and Well Being, $140,000

Role of PRRSV Specific Antibodies in Protective Immunity Against Porcine Reproductive and Respiratory Syndrome Virus Infections

Osorio, FA. 2002-2004. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), Sustaining Animal Health and Well Being, $200,000

Serum Neutralization of Group A Bovine Rotaviruses with G6 and G10 Genotypes

Duhamel GE. 1999-2000. Pfizer Animal Health, $17,011

Targeting *M. tuberculosis* Alanine Ligase for Drug Design

Barletta RG. 2002-2004. National Institute of Health (NIH), $145,000

The Effect of Porcine Reproductive and Respiratory Syndrome Virus on the Immune System During Acute and Persistent Infections

Osorio FA. 1999-2002. United States Department of Agriculture (USDA), National Research Initiative Competitive Grant Program (NRICGP), Sustaining Animal Health and Well Being), $150,000

Train Junior Faculty in Establishing a Research Center for Redox Biology

Banerjee R and Lou MF. 2002-2007. Redox Biology Center Cobra Grant, National Institute of Health (NIH) $10 million

Up-Regulation of K+Channels in the Remodeled Ventricle

Rozanski GJ and MF Lou. 2000-2004. National Institute of Health (NIH), University of Nebraska Medical Center, $1,081,579

Use of a Green-Fluorescent Protein-Expressing Strain of Porcine Reproductive and Respiratory Syndrome Virus for the Study of PRRSV Pathogenesis and *In Vivo* Tropism

Osorio FA and Pattnaik AK. 2005-2006. United States Department of Agriculture (USDA), National Research Initiative Competitive Grants Program (NRICGP), $129,600

Use of Beneficial Plant-Microbe Interactions to Enhance Biomass Yield, and Economic Value and Sustainability of Agricultural Products

Vidaver AK, RG Barletta, PH Blum and TJ Klopfenstein. 2002-2003. University of Nebraska Lincoln, Strategic Research Cluster Grant, $10,000

Vaccination as an *E. coli O157:H7* Intervention Strategy, phase II study

Moxley RA, Klopfenstein TJ, Smith DR, Erickson GE and Hinkley S. 2004. Bioniche Life Sciences, Inc, $152,790

Vaccination as an *E. coli* O157:H7 Intervention Strategy, phase II

Klopfenstein TJ, Smith DR, Moxley RA, Erickson and Hinkley S. 2003. Nebraska Beef Council, $50,000

Validation of Test Methods Needed to Evaluate Intervention Strategies for *Escherichia coli O157:H7* Intestinal Colonization and Fecal Shedding in Feedlot Cattle
Moxley RA, Hinkley S, Smith DR, Erickson GE and Klopfenstein TJ. 2004-2005. Nebraska Beef Council, $45,080

Vitamin-Dependent Modifications of Histones
Janos Zempleni and Lou MF. 2003-2007. National Institute of Health (NIH), $1,087,586

VSV RNA Transcription and Replication
Pattnaik AK. 1991-2000. National Institutes of Health (NIH), $538,000

VSV RNA Transcription and Replication
Pattnaik AK. 2001-2006. National Institutes of Health (NIH), $1,495,688

COMMODITY GRANTS

Bovine Genetics-Quality Assurance Research Program
Steffen DJ. 1997-2005. National Association of Animal Breeders, $109,000

Chronic Wasting Disease Surveillance in Deer
Steffen DJ. 2002-2003. Nebraska Game and Parks Commission, $85,000

Control of Johne's Disease: Laboratory Enhancement
Steffen DJ. 2003-2004. Nebraska Department of Agriculture, $25,000

CWD Validation of the ELISA Assay for Use in White-Tailed Deer
Steffen DJ. 2002-2003. Bio-Rad Reagents $60,600(CWD test kits) Equipment plate reader and two ribolyzers $35,803; total value $100,803

Evaluation of Automated Meat Recovery Systems
Steffen DJ. 2003. Dr. Thipareddi, Department of Food Science and Technology, $7,430

Evaluation of Anthrax Rapid Detection Kits
Steffen DJ. 2003-2004. Nebraska Department of Agriculture, $475

Genetic Disease Diagnosis and Consulting
Steffen DJ. 2003. American Simmental Association, $4,900

Induction of Protective Immunity Against Systemic BVDV1 and BVDV2 Infection
Kelling CL and Steffen DJ. 2003-2004. Schering-Plough Animal Health, $144,000

Johne's Disease Herd Testing
Steffen DJ. 2003. Nebraska Department of Agriculture, $1,009

Pseudorabies Eradication and Control Testing
Steffen DJ. 2003. Nebraska Department of Agriculture, $22,994

Scrapie Program
Steffen DJ. 2002-2003. United States Department of Agriculture (USDA), $61,000

West Nile Surveillance
Steffen DJ. 2002-2004. Nebraska Department of Health Human Services, $58,320.63

West Nile Surveillance and Serologic Response in Horses
Steffen DJ. 2003-2004. Nebraska Department of Agriculture, $2,940

GENERATED REVENUES

Spirochetal Colitis Research
Duhamel GE. 2000-2005. International Reference Laboratory, University, Industry and Practitioners, $7,310

Monoclonal Antibodies
Duhamel GE. 1998-2003. University, Diagnostic Laboratories, $498

INDUSTRY

Efficacy of CarbadoxR for the Control and Treatment of Porcine Proliferative Enteropathy (PPE) Associated with a Natural Infection of Lawsonia intracellularis
Doster AR, S Hinkley and HE Cerny. 2002. Philbro Animal Health, $14,841

Genetic Resistance to Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)
Johnson R, FA Osorio and AR Doster. 2002-2004. Nebraska Pork Producers Association, $25,000

EQUIPMENT GRANT

Optical Microscopy Station for Micromanipulation and Nanosynthesis
Doudin B and Duhamel GE. 2001. Nebraska University Foundation Grant Program, $186,000

TRAVEL GRANTS

Travel to American Association of Veterinary Laboratory Diagnosticians Meeting
Duhamel GE. 2001. Hershey, PA. Institute of Agriculture and Natural Resources (IANR), Research Travel Fund, $500

Travel to International Pig Veterinary Society Annual Meeting
Duhamel GE. 2000. Melbourne, Australia. Novartis Animal Health, $9,174

Travel to Allen D. Leman Swine Conference
Duhamel GE. 2000. Minneapolis, MN. Novartis Animal Health, $955

Travel to Facultat de Veterinaria, Universitat Autonoma de Barcelona, Bellaterra, Spain; Odense and Viborg, Denmark; Ekenäs and Stockholm, Sweden, and Saint Brieuc/ Ploufragran, France
Duhamel GE. 2000. Novartis Animal Health, $5,000

Travel to Setna Pig Production Club, Lérida and Universidad Complutense de Madrid, Madrid and León University, León, Spain
Duhamel GE. 2000. Setna Nutrición SA, $3,500

ALLIED INDUSTRY GRANTS

BQA Training CD (BQA Train-the-Trainer Self-Study CDs)
Griffin DD, DM Grotelueschen and RA Smith. 2000. Boehringer, Butler, Fort Dodge, Grand Labs, Merial, Pharmacia-Upjohn, Schering-Plough, $7,000

GRANTS RELATED TO TEACHING (5 YEAR RECORD)

Summer Undergraduate Research. Support for Senior Undergraduate Projects
Duhamel, GE. 2002-2005. Nebraska Wesleyan University, Howard Hughes Medical Institute Fellowships for Undergraduate Student Projects, $20,000

Undergraduate Creative Activities and Research Experiences Program
Duhamel, GE. 2002-2005. University of Nebraska-Lincoln, $6,000

PATENTS IN 2005

D-alanine Racemase Mutants of Mycobacteria and Uses Therefore
Barletta RG and O Chacon. U.S. Patent No. 6,929,799 B2, Granted August 16, 2005

Recombinant Mycobacteria Overexpressing D-alanine Ligase Gene and Uses Therefore
Barletta RG and Z Feng. December 17, 2002. US Patent Application Serial #10/738,938, pending

Identification of Virulence Determinants
Barletta RG and NB Harris. January 11 2001. US Patent Application Serial #09/759,287, pending

A Method to Enhance the Immunogenicity of PRRSV GP5 Protein
Pattnaik AK. Pending

2005 REFERRED PUBLICATIONS

A Viral Model for Corneal Scarring and Neovascularization Following Ocular Infection of Rabbit with a Herpes Simplex Virus Type 1 (HSV-1) Mutant

Barsam CA, DJ Brick, CJ Jones, SL Wechsler and G-C Perng. 2005. Cornea, 24:460-466, ARD Journal Series #14290

A Herpes Simplex Virus Type 1 Mutant Expressing A Baculovirus Inhibitor of Apoptosis Gene (cpIAP) in Place of LAT (Latency Associated Transcript) has a Wild Type Reactivation Phenotype in the Mouse

Jin L, G-C Perng, KR Mott, N Osorio, J Naito, DJ Brick, D Carpenter, CJ Jones and SL Wechsler. 2005. Jouornal of Virology, 79:12286-12295, ARD Journal Series #14594

Analysis of a Bovine Herpesvirus 1 (BHV-1) Recombinant Virus that Does Not Express the bICP0 Protein

Geiser V, Y Zhang and CJ Jones. 2005. Journal of General Virology, 86:1987-1996, ARD Journal Series #14913

Association of Passive Transfer Levels with Health and Performance in Beef Calves

Dewell RD, Hungerford LL, Keen JE, Laegreid WW, Griffin DD, Rupp GP and Grotelueschen DM. 2005. Journal of American Veterinary Medical Association (JAVMA), ARD Journal Series #14580

Biological Responses to PRRSV in Pigs of Two Genetic Populations to PRRSV

Petry DB, Holl JB, Weber J, Doster AR, Osorio FA and Johnson RK. 2005. Journal Animal Science, 83(7):1494-502, ARD Journal Series #14791

Biological Response to Porcine Respiratory and Reproductive Syndrome Virus in Pigs of Two Genetic Populations

Petry DB, JW Holl, JS Weber, AR Doster, FA Osorio and RK Johnson. 2005. Journal of Animal Science, 83(7):1494-502, ARD Journal Series #14791

Characterization of Cytolethal Distending Toxin of *Campylobacter* Species Isolated From Captive Macaque Monkeys

Dassanayake RP, Zhou Y, Hinkley S, Stryker CJ, Plauche G, Borda JT, Sestak K and Duhamel GE. 2005. Journal of Clinical Microbiology, 43:641-649, ARD Journal Series #14670

Characterization of Protection From Systemic Infection and Disease by Use of a Modified-Live Noncytopathic Bovine Viral Diarrhea Virus Type 1 Vaccine in Experimentally Infected Calves

Kelling CL, Hunsaker BD, Steffen DJ, Topliff CL, Abdelmagid OY and Eskridge KM. 2005. American Journal of Veterinary Research, 66(10):1785-91, ARD Journal Series #14367

Characterization of Protection From Systemic Infection or Disease by use of a Modified-Live Non-Cytopathic Bovine Viral Diarrhea Virus Type 1 in Experimentally-Infected Calves

Kelling CL, BD Hunsaker and DJ Steffen. 2005. American Journal of Veterinary Research, 66:1785-1791, ARD Journal Series #14376

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Penicillin-Binding Proteins in the Pathogenic Intestinal Spirochete *Brachyspira pilosicoli*

Dassanayake RP, Sarath G and Duhamel GE. 2005. Antimicrobial Agents and Chemotherapy, 49:1561-1563, ARD Journal Series #14743

Persistence and Reactivation of Bovine Herpesvirus 1 in the Tonsils of Latently Infected Calves

Winkler MTC, AR Doster and CJ Jones. 2000. Journal of Virology, 74:5337-5346

Persistent Bovine Viral Diarrhea Virus Infection in Beef Herds

Wittum TE, DM Grotelueschen, KV Brock, W Kvasnicka, J Floyd, CL Kelling and KG Odde. 2000. Preventive Veterinary Medicine, 49:83-94

Perturbations in Homocysteine-Linked Redox Homeostasis in a Murine Model for Hyperhomocysteinemia

Vitvitsky V, S Dayal, S Stabler, Y Zhou, H Wang, SR Lentz and R Banerjee. 2004. American Journal of Physiology Regulatory, Integrative and Comparative Physiology, 287(1):R39-46

Phagocytosis and Itracellular Survival of *Mycobacterium avium* subsp. paratuberculosis in Bovine Monocytes and a Macrophage Cell Line

Woo S-R, J Sotos, AP Hart, RG Barletta and CJ Czuprynski. E-Pub. 2005. Veterinary Immunology and Immunopathology, ARD Journal Series #14971

Phosphorylation of Vesicular Stomatitis Virus Phosphoprotein P is Indispensable for Virus Growth

Das SC and Pattnaik AK. 2004. Journal of Virology, 78:6420-30

Platelet Derived Growth Factor (PDGF) -Induced Redox Oxygen Species In the Lens Epithelial Cells: The Redox Signaling

Chen CW, Zhou J, Xing K, Krysan K and Lou MF. 2004. Experimental Eye Research, 78:1057-1067, ARD Journal Series #14230

Porcine Intestinal Epithelial Cell Lines as an *in vitro* Model for Studying Pathogenesis of Porcine Enterotoxigenic *Escherichia coli*

Koh SY, S George, V Brözel, RA Moxley, D Francis and RS Kaushik. 2008. Veterinary Microbiology, in press

Prevalence of *Brachyspira* Species Isolated From Diarrhoeic Pigs in Brazil

Barcellos DESN, MR Mathiesen, M deUzeda, IITA Kader and GE Duhamel. 2000. Veterinary Record, 146:398-403, ARD Journal Series #12571

Primary Infection, Latency and Reactivation of Bovine Herpesvirus Type 5 (BHV-5) in the Bovine Nervous System

Perez SE, Bretschneider G, Leunda MR, Osorio FA, Flores EF, Odeon AC.2002. Veterinary Pathology, 39:437-444

Progress Toward Characterization of the Group A *Streptococcus Metagenome*: Complete Genome Sequence of a Macrolide-Resistant Serotype M6 Strain

DJ Banks, SF Porcella, KD Barbian, SB Beres, LE Phillips, JM Voyich, FR DeLeo, JM Martin, GA Somerville and JM Musser. 2004. Journal of Infectious Diseases, 190:727-738

***Staphylococcus aureus* ClpC is Required Stress Resistance, Aconitase Activity, Growth Recovery and Death**

Chatterjee I, P Becker, M Grundmeier, M Bischoff, GA Somerville, B Sinha, G Peters, RA Proctor and M Herrmann. 2005. Journal of Bacteriology, 187:4488-4496

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Quorum Sensing Control of Biofilm Factors in *Staphylococcus Epidermidis*

C Vuong, C Gerke, GA Somerville, ER Fisher and M Otto. 2003. Journal of Infectious Diseases, 188:706-718

Redox Control of K+ Channel Remodeling in Rat Ventricle

Li Xun, Li S, Xu Z, MF Lou, P Anding, D Liu, KR Shyamal and GJ Rozanski. 2005. American Journal of Physiology Heart and Circulatory Physiology, 288:417-24

Reduced Intestinal Colonization of Adult Beef Cattle by *Escherichia coli* O157:H7 Tir Deletion and Nalidixic Acid-Resistant Mutants Lacking Flagellar Expression

Bretschneider G, EM Berberov and RA Moxley. 2007. Veterinary Microbiology, 125:381-386

Region of Herpes Simplex Virus Type 1 Latency-Associated Transcript Sufficient for Wild-Type Spontaneous Reactivation Promotes Cell Survival in Tissue Culture

M Inman, Perng G-C, G Henderson, AB Nesburn and SL Wechsler and CJ Jones. 2001. Journal of Virology, 75:3636-3646, ARD Journal Series #13153

Regulation of Caspase 8-and Caspase 9-Induced Apoptosis by the HSV-1 Latency Associated Transcript

Henderson G, W Peng, L Jin, G-C Perng, AB Nesburn, SL Wechsler and CJ Jones. 2002. Journal of Neurovirology, 8(suppl 2):103-111, ARD Journal Series #13725

Relative Importance of Heat-Labile Enterotoxin in the Causation of Severe Diarrheal Disease in the Gnotobiotic Piglet Model by a Strain of *Escherichia coli* that Produces Multiple Enterotoxins

Berberov EM, Y Zhou, DH Francis, MA Scott, SD Kachman and RA Moxley. 2004. Infection and Immunity, 72:3914-3924

Revival of Inactive Glyceraldehydes 3-Phosphate Dehydrogenase in Human Cataract Lenses by Reduction

Rachdan D, Lou MF and Harding JJ. 2004. Experimental Eye Research, 79:105-9, ARD Journal Series #14520

Rgg Coordinates Virulence Factor Synthesis and Metabolism in Streptococcus Pyogenes

MS Chaussee, GA Somerville, L Reitzer and JM Musser. 2003. Journal of Bacteriology, 185:6016-6024

Ribozyme Termination of RNA Transcripts Down-Regulate Seed Fatty Acid Genes in Transgenic Soybean

Buhr T, S Sato, F Ebrahim, A Xing, Y Zhou, M Mathiesen, B Sweiger, A Kinney, P Staswick and T Clemente. 2002. The Plant Journal, 30(2):155-163

Role of Neutralizing Antibodies in PRRSV Protective Immunity

Lopez OJ and Osorio FA. 2004. Veterinary Immunology and Immunopathology, 102(3):155-63, ARD Journal Series #13915

Role of the Hypervariable Hinge Region of Phosphoprotein P of Vesicular Stomatitis Virus in Viral RNA Synthesis and Assembly of Infectious Virus Particles

Das SC and Pattnaik AK. 2005. Journal of Virology, 79:8101-8112

Roles of *Mycobacterium smegmatis* D-alanine-Dalanine Ligase and D-alanine Racemase in the Mechanisms of Action and Resistance to the Peptidoglycan Inhibitor D-cycloserine

Feng Z and RG Barletta. 2003. Antimicrobial Agents and Chemotherapy, 47:283-291, ARD Journal Series #13729

Septicemia Associated with Stenotrophomonas Maltophlia in a West African Dwarf Crocodile (*Osteolaemus Tetraspis* subsp. Tetraspis)

Harris NB and DG Rogers. 2001. Journal of Veterinary Diagnostic Investigation, 13:255-258, ARD Journal Series #12966

Serologic Survey of Select Infectious Diseases in Coyotes and Raccoons In Nebraska

Bischof R, Rogers DG and Hack MA. 2008. Journal of Wildlife Diseases, in press, ARD Journal Series #14587

Severe Disease in Calves Inoculated with a Genotype II Isolate of Bovine Viral Diarrhea (BVDV)

Odeon AC, CL Kelling, DL Marshall, ES Estella, EJ Dubovi and RO Donis. 1999. Journal of Veterinary Diagnostic Investigation, 11:221-228

Significance of Heat-Stable and Heat-Labile Enterotoxins in Porcine Colibacillosis in an Additive Model for Pathogenicity Studies

Zhang W, EM Berberov, J Freeling, D He, RA Moxley and DH Francis. 2006. Infection and Immunity, 74:3107-3114

Sodium Phenylacetate Inhibits the Adoptive Transfer of Experimental Allergic Encephalomyelitis in SJL/J Mice at Multiple Steps

Dadgupta S, Y Zhou, M Jana, NL Banik and K Pahan. 2003. Journal of Immunology, 170(7):3874-82

***Staphylococcus Aureus* Aconitase Inactivation Unexpectedly Inhibits Post-Exponential Growth and Enhances Stationary Phase Survival**

GA Somerville, MS Chaussee, CI Morgan, JR Fitzgerald, DW Dorward, LJ Reitzer and JM Musser. 2002. Infection and Immunity, 70:6373-6382

***Staphylococcus epidermidis* Polysaccharide Intercellular Adhesin Production Significantly Increases During Tricarboxylic Acid Cycle Stress**

C Vuong, JB Kidder, ER Jacobson, M Otto, RA Proctor and GA Somerville. 2005. Journal of Bacteriology, 187:2967-2973

Stimulation of Bovine Herpesvirus 1 Productive Infection by the Adenovirus E1A Gene and the Cellular Transcription Factor E2F4

Geiser V and CJ Jones. 2003. Journal of General Virology, 84:929-938, ARD Journal Series #13956

Synthesis and Deformylation of *Staphylococcus aureus* -Toxin are Linked to Tricarboxylic Acid Cycle Activity

GA Somerville, A Cockayne, M Dürr, A Peschel, M Otto and JM Musser. 2003. Journal of Bacteriology, 185:6686-6694

Testing and Management Strategies for Effective Beef and Dairy Herd BVDV Biosecurity Programs

Kelling CL, DM Grotelueschen, DR Smith and BW Brodersen. 2000. Bovine Practitioner, 34:13-22

Testing and Management Strategies for Effective Beef and Dairy Herd BVDV Biosecurity Programs

Kelling CL, Grotelueschen DM, Smith DR and Brodersen BW. 2000. Bovine Practitioner, 34(1):13-22

The Genome of Swinepox Virus

Afonso CL, Tulman ER, Lu Z, Zsak L, Osorio FA, Balinsky C, Kutish GF and DL Rock. 2002. Journal of Virology, 76(2):783-790

The Presence of a Transsulfuration Pathway in the Lens: A New Oxidative Stress Defense System

Persa C, Pierce A, Ma Z and Lou MF. 2004. Experimental Eye Research, 79:875-886, ARD Journal Series #14519

The Gene that Encodes the Herpes Simplex Virus Type 1 (HSV 1) Latency Associated Transcript (LAT) Influences the Accumulation of the Transcripts (Bcl-xL and Bcl-xS), that Encode Apoptotic Regulatory Proteins

Peng W, G Henderson, G-C Perng, AB Nesburn, SL Wechsler and CJ Jones. 2003. Journal of Virology, 77:10714-10718, ARD Journal Series #14218

The BHV-1 LR Gene's Ability to Restore the High Reactivation Phenotype to an HSV-1 LAT Null Mutant Appears to be Due to its Anti-Apoptosis Function

Mott K, N Osorio, L Jin, D Brick, J Naito, J Cooper, G Henderson, M Inman, CJ Jones, SL Wechsler and G-C Perng. 2003. Journal of General Virology, 84:2975-2985, ARD Journal Series #14040

The Latency Related Gene Encoded by Bovine Herpesvirus 1 (BHV-1) Promotes Virus Growth and Reactivation from Latency in Tonsils of Infected Calves

Perez S, M Inman, AR Doster and CJ Jones. 2005. Journal of Clinical Microbiology, 43: 393-401, ARD Journal Series #14736

The Cytolethal Distending Toxin B Subunit of *Helicobacter hepaticus* is a Ca^{2+}- and Mg^{2+}-Dependent Neutral Nuclease

Dassanayake RP, Griep MA and Duhamel GE. 2005. Federation of European Microbiology Societies Letters, 251:219-225, ARD Journal Series #14992

The Immunogenicity of *Mycobacterium* paratuberculosis 85B Antigen

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The Latency Related (LR) Gene of Bovine Herpes Virus 1 (BHV-1) Can Inhibit the Ability of bICP0 to Activate Productive Infection

Geiser G, M Inman, Y Zhang and CJ Jones. 2002. Journal of General Virology, 83:2965-2971, ARD Journal Series #13664

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The Latency Related Gene of Bovine Herpesvirus 1 Enhances Ocular Shedding in Acutely Infected Calves

Inman M, L Lovato, AR Doster and CJ Jones. 2001. Journal of Virology, 75:8507-8515, ARD Journal Series #13427

The Latency Related (LR) Gene Encoded by Bovine Herpesvirus 1 (BHV-1) Can Suppress Caspase 3 and Caspase 9 Cleavage During Productive Infection

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The Possible Physiological Function of Thioltransferase in Cells

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The Bovine Herpes Virus 1 Immediate Early Protein (bICP0) Associates with Histone Deaetylase 1 to Activate Transcription

Zhang Y and CJ Jones. 2001. Journal of Virology, 75:9571-9578, ARD Journal Series #13426

The Zinc Ring Finger of Bovine Herpes Virus 1 Encoded bICP0 is Necessary for Transcriptional Regulation and Infection

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The Locus Encompassing the Latency-Associated Transcript (LAT) of Herpes Simplex Virus Type 1 Interferes with and Delays Interferon Expression in Productively Infected Neuroblastoma Cells and Trigeminal Ganglia of Acutely Infected Mice

Peng W, G Henderson, M Inman, L BenMohamed, G-C Perng, S L Wechsler and CJ Jones. 2005. Journal of Virology, 79:6162-6171, ARD Journal Series #14558

Thioltransferase as an Ascorbate Recycling Enzyme in Human Lens Epithelial Cells

Fernando M Rohan, Makoto A, Monnior V and Lou MF. 2004. Investigation Ophthalmology Visual Science, 45:230-237, ARD Journal Series #14083

Tibial Hemimelia Meningocele, and Abdominal Hernia in Shorthorn Cattle

Lapointe JM, Lachance S and Steffen DJ. 2000. Veterinary Pathology, 37:508-511, ARD Journal Series #12777

Transmission of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) to Age-Matched Sentinel Pigs

Wills RW, AR Doster and FA Osorio. 2002. Journal of Swine Health and Production, 10(4):161-165, ARD Journal Series #13767

Use of a Portable Real-time Reverse Transcriptase -Polymerase Chain Reaction Assay for Rapid Detection of Foot-and-Mouth Disease Virus

Callahan JD, Brown F, Osorio FA, Sur JH, Kramer E, Long GW, Lubroth J, Ellis SJ, Shoulars KS, Gaffney KL, Rock DL and Nelson WM. 2002. Journal of American Veterinary Medial Association, 220(11):1636-1642

Use of Rope-Devices to Describe and Explain the Feedlot Ecology of *Escherichia coli* O157:H7 by Time and Place

Smith DR, Moxley RA, Clowser SL, Folmer JD, Hinkley S, Erickson GE and Klopfenstein TJ. 2005. Foodborne Pathogens & Disease, 2(1)50-60, ARD Journal Series #14640

Use of Rope-Devices to Describe and Explain the Feedlot Ecology of *Salmonella* by Time and Place

Smith DR, Moxley RA, Clowser SL, Folmer JD, Hinkley S, Erickson GE and Klopfenstein TJ. 2005. Foodborne Pathogens and Disease, 2(1)61-69, ARD Journal Series #14641

Vesicular Stomatitis Virus Infection and Neuropathogenesis in the Murine Model are Associated with Apoptosis

Sur JH, R Allende and AR Doster. 2003. Veterinary Pathology, 40:512-520, ARD Journal Series #14081

West Nile Virus Infection in Reindeer (Rangifer tarandus)

Palmer MV, WC Stoffregen and DG Rogers, et al. 2004. Journal of Veterinary Diagnostic Investigation, 16:219-222

NON-REFERRED PUBLICATIOINS AND RESEARCH REPORTS 2005

Characterization of a Novel *Campylobacter* Cytolethal Distending Toxin from *Campylobacter hyointestinalis* subsp. *hyointestinalis* Isolated from Humans and Pigs

Dassanayake RP, Stryker CJ, Johnson RK, Muraoka WT, Wesley IV and Duhamel GE. 2005. 3rd International Rushmore Conference on Enteric Diseases, Rapid City, South Dakota, September 29-October 1; poster

Chronic Enterocolitis of Rhesus Macaque: A Non-Human Primate Model of Inflammatory Bowel Disease

Sestak K, Borda J and Duhamel GE. 2005. Inflammatory Bowel Disease: Research Drives Clinics, Genetics, Barrier Function, Immunologic and Microbial Pathways. Muenster, Germany, September 2-3; poster

Construction of a Full-Length cDNA Infectious Clone of a European-like Type 1 PRRSV Isolated in the U.S.

Fang Y, Faaberg KS, Rowland R, Christopher-Hennings J, Pattnaik AK, Osorio FA and Nelson EA 2005. *In*: The Nidoviruses: The Control of SARS and Other Nidovirus Diseases. Edited by S Perlman and K Holmes, in press

Direct-Fed Microbial Products for *Escherichia coli* O157:H7 in Market Ready Feedlot Cattle

Peterson RE, DR Smith, RA Moxley, TJ Klopfenstein, S Hinkley and GE Erickson. 2005. Nebraska 2005 Beef Report. Agricultural Research Division, University of Nebraska Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, MP 83-A, pp. 64-65

Mucosal Colonic Biopsies for Diagnosis of Sub-Clinical Colitis in Callitrichids Kept in a Zoo Collection

Mercado JA, Curro TG, Armstrong DL and Duhamel GE. 2005. American Association of Zoo Veterinarians and American Association of Wildlife Veterinarians Joint Conference, Omaha, Nebraska, October 14-21

Spontaneous Colitis of Captive Tamarins Kept in a Semi-Natural Mixed Species Zoo Exhibit

Mercado JA, Curro TG, Armstrong DL and Duhamel GE. 2005. American Association of Zoo Veterinarians and American Association of Wildlife Veterinarians Joint Conference, Omaha, Nebraska, October 14-21

The Cytolethal Distending Toxin B Subunit of *Helicobacter hepaticus* is a Nuclear Localizing Ca^{2+}- and Mg^{2+}-Dependent Endonuclease

Dassanayake RP, Griep MA and Duhamel GE. 2005. 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia, June 5-9, Abstract B-008, poster

Vaccination for *Escherichia coli* O157:H7 in Market Ready Feedlot Cattle

Peterson RE, Smith DR, Moxley RA, Klopfenstein TJ, Hinkley S and Erickson GE. 2005. Nebraska 2005 Beef Report, MP 83-A. Agricultural Research Division, University of Nebraska Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, Lincoln, NE, pp. 61-63:
http://ianrpubs.unl.edu/beef/mp83_2005_Beefreport.pdf

85TH ANNUAL MEETING CONFERENCE RESEARCH WORKERS IN ANIMAL DISEASES

The US Porcine *Campylobacter coli* are Negative for Cytolethal Distending Toxin Activity

Dassanayake RP, Stryker CJ, Johnson RK, Gebhart CJ, Post KW, Hinkley S, Muraoka WT, Wesley IV and Duhamel GE. 2005. 85th Annual Meeting Conference Research Workers in Animal Diseases, St. Louis, Missouri, December 4-6, P22, poster

The Cytolethal Distending Toxin B Sub-Unit of *Helicobacter hepaticus* Localizes to the Nucleus and is the Main Determinant for Intoxication of Eukaryotic Cells

Dassanayake RP and Duhamel GE. 2005. 85th Annual Meeting Conference Research Workers in Animal Diseases, St. Louis, Missouri, December 4-6, P52, poster

BOOKS AND BOOK CHAPTERS IN 2005

Mycobacterium Bovis Infection in Animals and Humans

Thoen CO and RG Barletta. 2005. Pathogenesis, Chapter 4. *In*: C.O. Thoen, JH Steele and MJ Gilsdorf (eds.), Second Edition, Blackwell Publishing, in press

Porcine Reproductive and Respiratory Syndrome Virus

Zimmerman J, Benfield D, Murtaugh M, Osorio FA, Stevenson G and Torremorell M. 2005. *In*: Diseases of Swine, 9th edition. Straw BE, D'Allaire S, Zimmerman J and Taylor DJ, eds. Blackwell Publishing Company, Ames Iowa, in press

Porcine Colonic Spirochetosis/Intestinal Spirochetosis

Hampson DJ and Duhamel GE. 2005. *In*: Diseases of Swine, 9th edition. Straw BE, D'Allaire S, Mengeling WL and Taylor DJ, eds. Iowa State University Press, Ames, Iowa, pp. 755-767, in press

Viral Diseases of the Fetus

Kelling CL. 2005. Current Therapy in Large Animal Theriogenology

OTHER PUBLICATIONS-PUBLIC PRESS, LAY JOURNALS, ETC
2005

RG Barletta

***In vivo* and *in vitro* Characterization of *Mycobacterium avium* subsp. paratuberculosis (MAP) Mutants**

A Livneh, L Golan, I Rosenshine, DK Zinniel, HK Chahal, O Chacon, RG Barletta and NY Shpigel. 2005. Submitted to the Proceeding of 8th International Colloquium on paratuberculosis

Development of Luminescent *M. avium* subsp. paratuberculosis for the Easy and Rapid Screening of Vaccine Candidates in Mice

V Rosseels, V Roupie, D Zinniel, RG Barletta and K Huygen. 2005. Submitted to the Proceeding of 8th International Colloquium on Paratuberculosis

GE Duhamel

Efficacy of Antimicrobial Agents for PCS Control

Duhamel GE. 2005. Pig Progress, Enteric Diseases Special III, p. 6-8

Understanding of Colitis in Swine Improved

Duhamel GE. 2005. Section 4 in Perspectives on Swine Disease Management, Novartis Animal Health, Basel, Switzerland, p. 1-6

***In vitro* and *in vivo* Efficacy of Antimicrobial Agents for Control of Porcine Colonic Spirochaetosis**

Duhamel GE. 2005. Section 5 in Perspectives on Swine Disease Management, Novartis Animal Health, Basel, Switzerland, p. 1-6

GP Rupp

- Animal Identification and Cowherd Records - Bovine Health Watch, Agrilabs

DR Smith

Food Safety and Beef Cattle Production

Smith DR. 2005. Nebraska Cattlemen BQA Newsletter. L Gordon, ed. Nebraska Cattlemen, Lincoln, NE, January/February, p4

The Prudent use of Antibiotics: An Important Food Safety Issue

Smith DR. 2005. Nebraska Cattlemen BQA Newsletter. L Gordon, ed. Nebraska Cattlemen, Lincoln, NE. March-April 2005

Media Resources

- Nebraska Farmer on Preparing for Bioterrorism
- Channel 10/11 Television Invterview Regarding Agroterrorism Preparedness
- CNN Television Interview Regarding Bioterrorism and the Potential to Poison Milk with Botulism Toxin
- Sandhill Calving System Featured in Articles in Drovers Journal, Beef Magazine
- UNL Research on *E.coli* O157:H7 Interventions Featured in Drovers Journal

FA Osorio

Antibody-Mediated Protection Against Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)

Interactive Audiovisual prepared for National Pork Board, presented at the NPB PRRSV Stand at World Pork Expo, Des Moines IA, June 8-11, 2005

Y "Joe" Zhou

- Installed and learned a MataMorph Imaging and Analysis Program

EXTENSION PUBLICATIONS IN 2005

Dicky D. Griffin

NebGuide: Safe Use of Animal Medications
Wohlers A, Griffin DD, Smith DR. 2005. University of Nebraska-Lincoln Extension, Lincoln, NE, USA

Gary P. Rupp

Biosecurity Handouts for Veterinarians and Llivestock Producers
"Getting Started with Biosecurity"
"Biosecurity in Practice Series: Dairy Herds, Replacement Heifers, Beef Breeding Herds, Beef Feedlots, and Sheep Flocks"
Revised Compact Disc for Biosecurity

David R. Smith

Safe Use of Animal Medications
Wohlers A, Griffin DD and Smith DR. 2005. NebGuide, University of Nebraska-Lincoln, Extension, Lincoln, NE USA.

Michael P. Carlson

Blue-Green Algae Poisoning of Animals for Pet and Animal Owners
Carlson, Michael P. and David R. Smith.. 2005. NebFact, in progress

Blue-Green Algae Poisoning of Animals
Carlson, Michael P. And David R. Smith. 2005. NebGuide, in progress

David R. Smith

Teaching Cattle Management to Prevent calf Scours. Action Plan: Food Production & Natural Resource Systems, Nutrition, Health and Food Safety

A conference on the Sandhills Calving System was held Jan 4, 2005 in the Wagonhammer Center at the Gudmundsen Sandhills Laboratory in Whitman, NE. Seminar speakers included veterinarians from the university's Institute of Agriculture and Natural Resources, private industry and private practice, and several cattle ranchers who have tested the system. Forty-one cattle ranchers and veterinarians attended the program.

As a result of this meeting 5 percent of ranchers planned no changes; 20 percent planned to discuss calf scours with their veterinarian; 20 percent planned to discuss plans for implementing the Sandhills Calving System with their veterinarian or UNL Cooperative Extension; 45 percent planned to use the Sandhills Calving System in the future; and 55 percent said they will probably use the Sandhills Calving System in their herds soon. This represents an important change in calving management practices.
Approval Date: 03/07/2005
Contact: David R. Smith (dsmith8@unl.edu)
Additional Team Members: Sharon Clowser, Bethany Sitz, Dale Grotelueschen Tim Knott Tom Noffsinger, Gail Nason and Harlow Hill

Multi-Site Satellite Beef Course

Summary: Fifteen sites across Nebraska hosted beef producers for the fifth annual UNL Extension Satellite Beef Shortcourse. During the five week course, 170 beef producers explored the subject of beef cow longevity, the factors that influence it and the economic implications of managing it. Producers learned that extending the productive life of a beef cow for just one year could provide a financial advantage of $25-$50. Those in attendance will be able to analyze their operations and incorporate knowledge presented in the areas of nutrition, genetics, animal health/biosecurity and financial management. Satellite video delivery with direct audio contact available via phone and fax was used. In addition, complimentary and related topics were presented by extension educators at host sites.

Impact: Post course evaluations indicated that 100% of participants would make changes in their operations intended to increase cow longevity, 100% of participants indicated that they were made more aware of the economic implications of cow longevity. Post program surveys showed that the average herd size of producers exceeded 200 head, with some sites having average herd size up to 400 head. This would indicate nearly two percent of the beef cow herd in Nebraska could be affected by the program.
Period: 2004-01-12 - 2004-02-16
Hours Taught: 15 Focus Area: Food Production & Natural Resource Systems
Number of Learners: 125

Livestock Disease Emergency Response Planning

Summary: Cuming County's status as one of the top livestock counties in Nebraska as well as one of the top in the nation prompted local leaders to begin making preparations to respond to potential threats to that segment of the agricultural industry. Considering that livestock represents 88 percent of the agricultural income in the county, a disease outbreak would be economically devastating. Cooperative Extension helped organize meetings with county leaders, producer groups, local emergency management, public health, law enforcement and veterinarians to discuss biosecurity preparedness. The goal was to provide an awareness to the issues and provide communication and create cooperation with the various groups.

Impact: As a result the groups have met to learn about the issues that would be important should an event occur and the livestock operations have all been identified and locations plotted on a map with references back to the plat map. The Public Health Department, Emergency Management and local responders have included the agriculture sector in their planning sessions. The group has hosted the Nebraska Department of Agriculture program "Agriculture Emergency Planning Session" to better understand the issues and prepare locally. Lt. Gov. Dave Heineman, who serves as director of Homeland Security in Nebraska, has been in the county and praised the efforts. He has said "The thing I was most impressed with was the coordination and cooperative effort they had toward biosecurity. Cooperative Extension was a key element of that." It was determined that there is a need to become more organized on the local level. Meetings were organized to include the groups that have been mentioned to provide awareness to the issues, open the communications and create cooperation. The livestock operations were identified by township then located on a large map. This will be used as a reference should a livestock disaster occur. The media has also been involved so the efforts are shared with the public.

Period: 2003-11-01 - 2005-11-30

Hours Taught: 15

Non IANR/CEHS Members: Dr. Ron Roland, DVM; Ginger Bailey, Steve Meister and Dr. Larry Williams

Focus Area: Food Production & Natural Resource Systems

Number of Learners: 40

Game Meat Safety Program

Summary: An in-service workshop was offered for UNL Extension educators on game meat safety because of concerns about game meat food safety and diseases associated with wild game.

Impact: Participants increased their knowledge of proper field dressing by 91%; understanding of diseased versus healthy animals by 90%; game meat processing by 84% and proper cooking techiques by 58%.

Period: 2004-09-15 - 2004-09-15

Hours Taught: 6

Non IANR/CEHS Members: Extension Specialist from Penn State - Kathy Cutter

Focus Area: Nutrition, Health and Food Safety

Number of Learners: 20

COMPUTER SOFTWARE, OTHER PUBLICATIONS OR MEDIA DEVELOPED IN 2005

Bruce W. Brodersen

- List owner for NEBVET-L
- List owner for NEB SWINEVETS

Dicky D. Griffin

Computer Software

- Educational Aides and Materials Developed
- Biosecurity Development Template CD - revised
- Improving the safety of subcutaneous injections in cattle. Video (funded by Nebraska Cattlemen=s Association)
- The A4 S=s of Safety. (funded by Elanco. Inc)

Gerald E. Duhamel

Efficacy of Antimicrobial Agents for PCS Control

Duhamel GE. 2005. Pig Progress, Enteric Diseases Special III, p. 6-8

Understanding of Colitis in Swine Improved

Duhamel GE. 2005. Section 4 in Perspectives on Swine Disease Management, Novartis Animal Health, Basel, Switzerland, p. 1-6

***In vitro* and *in vivo* Efficacy of Antimicrobial Agents for Control of Porcine Colonic Spirochaetosis**

Duhamel GE. 2005. Section 5 in Perspectives on Swine Disease Management, Novartis Animal Health, Basel, Switzerland, p. 1-6

Gary P. Rupp

- CowCalf5 - Further Updates and Program Enhancements
- Book Chapter - Beef Practice: Cow-calf Production Medicine. Peter J. Chenoweth and Michael W. Sanderson, co-editors. Blackwell Publishing, 1st Ed, 2005

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES PRESENTATIONS FOR 2005

α-Herpsvirus Latency
Jones, CJ. 2005. Intercampus Virology Meeting, March

An Update on Ongoing PRRSV Immunobiology Research
Moxley RA. 2005. Presentation at the 46th Annual George A. Young Swine Health and Management Conference, South Sioux City, Nebraska, August 11

Analysis of α-Herpesvirus Genes that Regulate the Latency-Reactivation Cycle
Jones, CJ. 2005. Cold Spring Harbor Symposium; Analysis of early events during viral infection, September

Analysis of BHV-1 Genes Expressed in Sensory Neurons of Latently Infected Calves
Jones CJ. 2005. European Society of Veterinary Virology (symposium on herpesviruses), Ghent, Belgium, invited Symposium Lecture

Analysis of Genes Expressed During α-Herpesvirus Latency
Jones CJ. 2005. Kansas State University, Department of Pathobiology, September

Animal ID in Beef Herds
Rupp GP. 2005. Farmer/Rancher College, Clay Center, Nebraska, January

Annual Meeting of the Nebraska Veterinary Medical Association
Kelling CL. 2005. January 23-25

Applying Population Dynamics to Disease Control
Smith DR. 2005 Spring Conference. Academy of Veterinary Consultants, Waikoloa Beach, HI, April 8

Assuring Beef Quality Strategies
Rupp GP. 2005. Nebraska Cattleman and Pfizer seminars, North Platte and Burwell Nebraska

Beef Quality Assurance
Steffen DJ. 2005. Nebraska Agriculture Educators Conference, Scottsbluff, NE, January 21

Biosecurity and Profitability
Steffen DJ. 2005. University of Nebraska-Lincoln Extension, Kimball, NE, November 16

Biosecurity and the Farm Visitor
Smith DR. 2005. Montrose/Dell Rapids Veterinary Clinic Client Education Meeting, Dell Rapids, SD, January 27

Biotechnology: Food, Health and Environment Tracing Disease Genes in Animals
Steffen DJ. 2005. Invited guest lecture/speaker Dr. Don Lee, March 28

Bovine Spongiform Encephalopathy
Steffen DJ. 2005. Scottsbluff Rotary Club, Scottsbluff, NE, January 11

Can Vaccination Reduce the Probability that Feedlot Cattle Shed *Escherichia coli* O157:H7?
Smith DR. 2005. Canadian Beef Cattle Stakeholders Meetings, Bioniche Life Sciences, Toronto, ON, Canada, April 27-28

Can Vaccination Reduce the Probability that Feedlot Cattle Shed *Escherichia coli* O157:H7?
Smith DR. 2005. Invited seminar, University of Guelph, Ontario Veterinary College, Guelph, Ontario, Canada, April 29

Can Vaccination Reduce the Probability that Feedlot Cattle Shed *Escherichia coli* O157:H7?
Smith DR. 2005. Canadian Beef Cattle Stakeholders Meeting, Bioniche Life Sciences, Calgary, AB, Canada, March 2-4

Can Vaccination Reduce the Probability that Feedlot Cattle Shed *Escherichia coli* O157:H7?
Smith DR. 2005. Beef Industry Food Safety Summit, Orlando, FL, April 19

Cecal Spirochetosis Caused by *Brachyspira pilosicoli* in Commercial Turkeys
Shivaprasad HL and Duhamel GE. 2005. 48th Annual Conference American Association Veterinary Laboratory Diagnosticians, Hershey, Pennsylvania, November 5-10, p. 109, oral presentation

Challenges and Prospects for Pre-Harvest Intervention Strategies for *Escherichia coli* O157:H7 in Cattle
Moxley RA. 2005. Kansas State University, College of Veterinary Medicine, Manhattan, KS, invited presentation

Challenges and Prospects for Pre-Harvest Intervention Strategies for *Escherichia coli* O157:H7 in Cattle
Moxley RA. 2005. Department of Veterinary and Biomedical Sciences Departmental Seminar, University of Nebraska-Lincoln, April 11

Characterization of a Novel *Campylobacter* Cytolethal Distending Toxin from *Campylobacter hyointestinalis* subsp. *hyointestinalis* Isolated from Humans and Pigs
Dassanayake RP, Stryker CJ, Johnson RK, Muraoka WT, Wesley IV and Duhamel GE. 2005. 3rd International Rushmore Conference on Enteric Diseases, Rapid City, South Dakota, September 29/October 1, poster presentation

Chronic Enterocolitis of Rhesus Macaque: A Non-Human Primate Model of Inflammatory Bowel Disease
Sestak K, Borda J and Duhamel GE. 2005. Inflammatory Bowel Disease: Research Drives Clinics, Genetics, Barrier Function, Immunologic and Microbial Pathways, Muenster, Germany, September 2-3, poster presentation

Clinical Trial Testing the Effect of Vaccination or Direct-Fed Microbial Products on Colonization of *E. coli* O157:H7 at the Terminal Rectum of Cattle
Peterson RE, Smith DR, Moxley RA, Klopfenstein TJ, Erickson GE and Hinkley S. 2005. Joint ADSA-ASAS-CSAS Meeting, July 24-28, Cincinnati, OH, oral/Abstract 314, page 104

Clinical Trial Testing the Effect of Vaccination and Direct-Fed Microbials on Prevalence of *E. coli* O157:H7 in Commercial Beef Feedlots

Peterson RE, Smith DR, Moxley RA, Klopfenstein TJ, Erickson GE and Hinkley S. 2005. Joint ADSA-ASAS-CSAS Meeting, July 24-28, Cincinnati, OH, poster/abstract W60, page 121

Cloning and Sequencing of Thioredoxin Binding Protein-2 (TBP-2) from Human Lens Epithelial Cells

Liyanage NPM, Fernando M Rohan and Lou MF. 2005. Proceedings of the 2005 Annual Meeting of the Association for Research in Vision and Ophthalmology, Fort Lordadale, Florida, May 5, poster/abstract

Cloning and Sequencing of Thioredoxin Binding Protein-2 (TBP-2) from Human Lens Epithelial Cells

NPM Liyanage, MR Fernando and MF Lou. 2005. Investigation Ophthalmology Visual Science, abstract, May

Colonic Spirochetosis of Humans and Animals: A Polymicrobial Infection by Multiple Species of *Brachyspira* and *Helicobacter*

Duhamel GE. 2005. Graduate Seminar Series, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, Nebraska, April 18

Comparison of Bovine Viral Diarrhea Virus Replication Kinetics *in vitro* Using Quantitative, Real-Time Reverse Transciption Polymerase Chain Reaction

Mori Y, Topliff CL and Kelling CL. 2005. Nebraska Academy of Sciences

Connecting the Dots: Metabolism and Pathogenesis in *Staphylococci*

Somerville GA. 2005. Host: Cheryl Bailey, Midland Lutheran College, Freemont, NE

Connecting the Dots: Metabolism and Pathogenesis in *Staphylococci*

Somerville, GA. 2005. Host: Julie Soukup. Creighton University, Omaha, NE

Cows with BSE and People with Mad Perspectives

Smith DR and Mark D. 2005. Livestock Grazing Systems Seminar, University of Nebraska-Lincoln, October 3

Dangers of Animal Medicines

Steffen DJ. 2005. IRM Pen of 5 Winter Conference, Harrisburg, NE, January 27

Development of *Luminescent M. avium* subsp. paratuberculosis for the Easy and Rapid Screening of Vaccine Candidates in Mice

V Rosseels, V Roupie, D Zinniel, RG Barletta and K Huygen. 2005. 8th International Colloquium on Paratuberculosis, August 16

Diagnosis and Control of Johne's Disease in Beef Cattle

Smith DR. 2005. Invited presentation at the University of Missouri, College of Veterinary Medicine, Columbia, MO, November 18

Diagnostic Approaches to Congenital Defects and Constructing a Control Program

Steffen DJ. 2005. American Society for Theriogenology Annual Meeting, Charleston, SC, invited speaker, August 11

Diagnostic Approaches to Congenital Defects

Steffen DJ. 2005. The Iowa Veterinary Medical Association Annual Meeting, September 29, invited speaker

Diseases of Deer, Deer Safe Harvest and Meat Safety Seminar

Doster AR. 2005. University of Nebraska and Hall County Extension Services, Grand Island, NE, November 3

Diseases of Deer, Wild Game Meat Safety Satellite Seminar

Doster AR. 2005. University of Nebraska Cooperative Extension Service, Lincoln, NE, June 3, Satellite Conference in Eight States and Canada

Disruption of Enterotoxin Genes of Enterotoxigenic *Escherichia coli* by Allelic Exchange Using Lambda Red-Mediated Recombineering

Erume J, EM Berberov and RA Moxley. 2005. Third International Rushmore Conference on Enteric Diseases, Rapid City, SD, September 29/October 1, poster presentation

Disruption of Enterotoxin Genes of Enterotoxigenic *Escherichia coli* by Allelic Exchange Using Lambda Red-Mediated Recombineering

Erume J, EM Berberov and RA Moxley. 2005. Nebraska Symposium on Interdisciplinary Graduate Science Research, University of Nebraska-Lincoln, Lincoln, NE, September 27, oral presentation

Effect of Reactive Oxygen Species on Lens Function

Lou MF. 2005. The Ying and Yang Seminar at the Ophthalmology Department, TongRen Hospital, The Beijing Capital University Medical School, April 16, in Beijing, China

Effects of an Experimental Vaccine on *Escherichia coli* O157:H7 Prevalence in the Feces and Colonized at the Terminal Rectum in Beef Feedlot Cattle

Peterson R, D Smith, R Moxley, T Klopfenstein, G Erickson and S Hinkley. 2005. Joint ADSA- ASAS-CSAS Meeting, July 24-28, Cincinnati, OH, oral/abstract 379, page 111

Epizootic Diseases of Nebraska Wildlife

Doster AR. 2005. Nebraska Center for Virology, The George W Beadle Center, University of Nebraska-Lincoln, Lincoln, NE, January 7

Graduate Education in the United States of America

Lou MF. 2005. Seminar at TangDu Hospital of the 4th Military Medical University, July 5, Xian, China

H_2O_2 Stress Sensitivity in Cultured Primary Mouse Lens Epithelial Cells Derived from Wild Type and Thioltransferase Knockout Mice

Lofgren S, Fernando M Rohan and Lou MF. 2005. Proceedings of the 2005 Annual Meeting of the Association for Research in Vision and Ophthalmology, Fort Lordadale Florida, May 5, poster/abstract presentation

H_2O_2 Stress Sensitivity in Cultured Primary Mouse Lens Epithelial Cells Derived from Wild Type and Thioltransferase Knockout Mice

Lofgren S, Fernando RM, Ho Y-S and Lou MF. 2005. Investigation Ophthalmology Visual Science, abstract, May

Health and Carcass Quality

Steffen DJ. 2005. IRM Pen of 5 Wrap-up Conference, Chadron, NE, June 14

***In vivo* and *in vitro* Characterization of *Mycobacterium avium* subsp. paratuberculosis (MAP) Mutants**

A Livneh, L Golan, I Rosenshine, DK Zinniel, HK Chahal, O Chacon, RG Barletta and NY Shpigel. 2005. 8th International Colloquium on Paratuberculosis, August 15

Influence of N-Glycans of the Attachment (G) Glycoprotein of Bovine Respiratory Syncytial Virus on Expression

Samson H, Topliff CL and Kelling CL. 2005. Nebraska Academy of Sciences

Influence of N-Glycans of the Attachment (G) Glycoprotein of Bovine Respiratory Syncytial Virus on Expression

Samson H, Topliff CL and Kelling CL. 2005. Universityof Nebraska-Lincoln, Undergarduate Research Conference

Introduction to Foreign Animal Disease

Steffen DJ. 2005. Wyo-braska Cattle Feeders, Gering, NE, March 22

Investigating the Initial Sites of Redox Signaling in Human Lens Epithelial Cells

Chen KCW, Zhou Y and Lou MF. 2005. Investigation Ophthalmology Visual Science, abstract, May

Investigations on the Use of Antibodies for PRRSV Control

Moxley RA. 2005. Presentation at the IASA-IDEXX 1st International Conference Series, in Mexico (4 different locations throughout the country), October 25-28

Invited Speaker, South Dakota State University

Moxley RA. 2005. Brookings, SD, September

Is *E. coli* O157:H7 Vaccination of Cattle Effective?

Smith DR. 2005. Invited presentation at the Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, ON, Canada, November 14

Malignant Catarrhal Fever in Two Cattle Feedlots

Bruce W Brodersen, Alan R Doster, Judith Galeota, Arden Wohlers, Roger Sahara and Travis Van Anne. 2005. Summer Meeting of the Nebraska Veterinary Medical Association, June 21, pgs 123-124

Mitochondrial and Nuclear Isoform of Thioltransferase (Grx2) has Peroxidase Activity in Lens Epithelial Cells

Fernando MR, Lechner JM, Gladyshev VN and Lou MF. 2005. Investigation Ophthalmology Visual Science, abstract, May

Mucosal Colonic Biopsies for Diagnosis of Sub-Clinical Colitis in Callitrichids Kept in a Zoo Collection

Mercado JA, Curro TG, Armstrong DL and Duhamel GE. 2005. American Association of Zoo Veterinarians and American Association of Wildlife Veterinarians Joint Conference, Omaha, Nebraska, October 14-21

Multidrug-Resistant *Salmonella*: the Bovine Practitioner's Role in Public Health

Smith DR. 2005. National Conference on Ground Beef Contaminated with Multidrug-Resistant *Salmonella*, Including *S. Typhimurium* DT104: An Emerging Public Health Concern, Tufts University School of Veterinary Medicine, Grafton, MA, March 7-8

Network on Antimicrobial Resistance in *Staphylococcus aureus* (NARSA)

Somerville GA. 2005. Richmond, VA, attendee

Nuclear and Mitochondrial Isofrom of Thioltransferase (Grx2) has Peroxidase Activity in Mouse Lens Epithelial Cells

Fernando M Rohan, Lechner J, Gladyshev VN and Lou MF. 2005. Proceedings of the 2005 Annual Meeting of the Association for Research in Vision and Ophthalmology, Fort Lordadale Florida, May 5, poster/abstract presentation

Outbreak of Malignant Catarrhal Fever in Two Feedlots

Bruce W Brodersen, Alan R Doster, Judith Galeota, Arden Wohlers, Roger Sahara and Travis Van Anne. 2005. North Central Conference of Veterinary Laboratory Diagnosticians, Fargo, ND, May 5

Population-Based Strategies for Monitoring Food Safety Pathogens in Feedlot Cattle

Smith DR, Moxley RA, Klopfenstein TJ, Peterson RE and Erickson GE. 2005. Beef Industry Food Safety Council (BIFSCO), Orlando, FL, April 20

Preparing for a Livestock Disease Emergency

Smith DR. 2005. Southeast Nebraska Pork Producers, DeWitt, NE, November 8

Preparing for a Livestock Disease Emergency

Smith DR. 2005. Knox County Emergency Planners Meeting, Bloomfield, NE, September 29

Presentation to VBMS 101 Class on Introduction to VBMS Curriculum and Pointers for Academic Success

Steffen DJ. Fall 2005. Guest lecture/speaker

Presentation on the Veterinary Diagnostic Laboratory and Department Activities at the Winter and Summer NVMA Meetings

Steffen DJ. 2005. Guest speaker

Preventing Calf Scours with the Sandhills Calving System

Smith DR. 2005. Nebraska Cattlemen's Seedstock Showcase, Phillipsburg, KS, February 7

Preventing Calf Scours with the Sandhills Calving System

Smith DR. 2005. University of Nebraska-Lincoln Extension, Holt County, O'Neill, NE, February 18

Preventing Calf Scours with the Sandhills Calving System

Smith DR. 2005. Montrose /Dell Rapids Veterinary Clinic Client Education Meeting, Dell Rapids, SD, January 27

Preventing Calf Scours with the Sandhills Calving System

Smith DR. 2005. University of Nebraska-Lincoln Gudmundsen Sandhills Laboratory, Whitman, NE, January 4

Preventing Calf Scours with the Sandhills Calving System

Smith DR. 2005. University of Nebraska, Extension, Brown, Rock, KeyaPaha Counties, Ainsworth, NE, February 17

Preventing Calf Scours with the Sandhills Calving System

Smith DR. 2005. University of Nebraska-Lincoln Extension, Custer County, Broken Bow, NE, February 3

Prevention of Neonatal Calf Diarrhea in Beef Systems

Smith DR. 2005. Invited presentation, University of Missouri College of Veterinary Medicine, Columbia, MO, November 18

Protecting Herd Health: Beef Cattle Biosecurity

Smith DR. 2005. Montrose/Dell Rapids Veterinary Clinic Client Education Meeting, Dell Rapids, SD, January 27

Protecting Herd Health: BVDV Biosecurity and Biocontainment

Smith DR. 2005. Montrose/Dell Rapids Veterinary Clinic Client Education Meeting, Dell Rapids, SD, January 27

PRRSV Immunological Issues

Moxley RA. 2005. Presentation at the Modern Veterinary Products, Omaha, Nebraska, October 19

PRRSV New Vaccine Developments

Moxley RA. 2005. Presentation at the Zhejiang University-Iowa State University Ensminger International School on Swine Diseases, Hangzhou, China, October 13-15

Reactive Oxygen Species: The Ying and Yang Effect on Lens Function

Lou MF. 2005. Seminar at TangDu Hospital of the 4th Military Medical University, Xian, China, July 5

Redox Signaling in the Lens Epithellial Cells: Regulation of Mitogenic Action of Platelet Derived Growth Factor (PDGF)

Lou MF. 2005. Seminar at the University of Nebraska-Lincoln, Redox Biology Summer Student Training Program, June 23

Regulation of Mitogenic Action of Platelet Derived Growth Factor (PDGF) on Cell Proliferation by Reactive Oxygen Species at Visual Function-Insights from the Revolution in Biology at the Molecular Level

Lou MF. 2005. Tel Aviv, Israel, June 15-17

Reinsertion of Thioltransferase (TTase) Enzyme Reverses Oxidative Stress Sensitivity of Lens Epithelial Cells from TTase Knockout Mice

Löfgren S, Fernando MR, Ho Y-S, Kuszynski CA and Lou MF. 2005. US-Japan Cooperative Cataract Research Group Meeting, Kona, Hawaii, October 29/November 2

Responsibilities of a Zoo Veterinarian

Steffen DJ. 2005. Riverside Zoo Youth Group, Scottsbluff, NE, June 13

Reversible Regulation of Human Lens Low Molecular Weight Protein Tyrosine Phosphatase by Oxidation

K-Y Xing and MF Lou. 2005. Investigation Ophthalmology Visual Science, abstract, May

Role of the Tir Protein in *Escherichia coli* O157:H7 Intestinal Colonization of Adult Cattle

Bretschneider G, EM Berberov and RA Moxley. 2005. Nebraska Symposium on Interdisciplinary Graduate Science Research, University of Nebraska-Lincoln, Lincoln, NE, September 27, poster presentation

Role of the Tir Protein in *Escherichia coli* O157:H7 Intestinal Colonization of Adult Cattle

Bretschneider G, EM Berberov and RA Moxley. 2005. Third International Rushmore Conference on Enteric Diseases, Rapid City, SD, September 29/October 1, poster presentation

Safe Use of Animal Medicines

Steffen DJ. 2005. Feedlot Roundtable, Grand Island, NE, February 15

Seminar presentations located in Tecumseh, Nebraska; Stockton, Kansas; Curtis, Nebraska and Winner and Parkston, South Dakota

Rupp GP. 2005. Invited speaker presentations

Serum Antibody Response by Horses to West Nile Virus and Equine Herpes Virus-1 Infections

Michele Pavelka, Bruce W Brodersen, David J Steffen and David R Smith. 2005. Winter Meeting of the Nebraska Veterinary Medical Association, January 25

Speaker, American Society for Microbiology

Moxley RA. 2005. Penn State University, State College, PA, June

Spontaneous Colitis of Captive Tamarins kept in a Semi-Natural Mixed Species Zoo Exhibit

Mercado JA, Curro TG, Armstrong DL and Duhamel GE. 2005. American Association of Zoo Veterinarians and American Association of Wildlife Veterinarians Joint Conference, Omaha, Nebraska, October 14-21

***Staphylococcal* Metabolism and Life in a Biofilm**

Somerville GA. 2005. University of South Dakota Medical School, Vermillion, SD

***Staphylococcal* Metabolism and Life in a Biofilm**

Somerville GA. 2005. Gordon Conference on *Staphylococcal* Diseases, Providence, RI

Staphylococcal Metabolism and Life in a Biofilm

Somerville GA. 2005. Gram-positive pathogenesis Meeting, Omaha, NE, platform speaker

Staphylococcal Metabolism and Life in a Biofilm

Somerville GA. 2005. Gordon Conference on _Staphylococcal_ Diseases, Providence, RI, invited speaker

Staphylococcus Epidermidis Polysaccharide Intercellular Adhesin Production Significantly Increases During Tricarboxylic Acid Cycle Stress

Somerville GA. 2005. Molecular Genetics of Bacteria and Phages, Madison, WI, platform speaker

The National Animal Identification Program, Records and Electronic Identification in the Beef Industry

Rupp GP. 2005. Guest speaker

The Search for Johne's Disease in Nebraska

Smith DR. 2005. Montrose/Dell Rapids Veterinary Clinic Client Education Meeting, Dell Rapids, SD, January 27

The Proportion of Nebraska Beef Cattle Herds with Johne's Disease and the Factors Explaining Herd Status

Smith DR, Schomer TJ, Hinkley S, Clowser S, Galeota JA, Weiss JC and Akin KJ. 2005. Nebraska Veterinary Medical Association Summer Meeting, June 21

The Presence of a Thioredoxin Binding Protein in the Lens: A Regulator of Thioredoxin Redox Function

Lou MF, Fernando MR and Liyanage NPM. 2005. US-Japan Cooperative Cataract Research Group Meeting, Kona, Hawaii, October 29/November 2

The Role of p22phox in Reactive Oxygen Species Generation in Human Lens Epithelial Cells

Wang Y and Lou MF. 2005. Investigation Ophthalmology Visual Science, abstract, May

The Nebraska Quality Milk Awards

Smith DR. 2005. Nebraska State Dairymen's Association Annual Meeting, University of Nebraska-Lincoln, ARDC, Ithaca, NE, March 17

The Medicine of Populations

Smith DR. 2005. Nebraska University Pre-Veterinary Club, University of Nebraska-Lincoln, Lincoln, NE, April 13

The Future of _E. coli_ O157:H7 Intervention in Live Cattle

Smith DR. 2005. Cardinal Meats Conference on Food Safety, Toronto, Ontario, Canada, June 24

Vaccination on the Ranch as an Intervention Strategy to Reduce the Probability of Detecting *E. coli* O157:H7 Associated with Commercial Feedlot Cattle

Peterson RE, JA Paterson, DR Smith, RA Moxley, TJ Klopfenstein, GE Erickson, WT Choat and S Hinkley. 2005. Western Section of the American Society of Animal Science, New Mexico State University, Las Cruces, NM, June 22-24, poster/abstract 83

Vaccination Against Type III Secreted Proteins as a Strategy to Control *Escherichia coli* in Cattle

Moxley RA. 2005. Third International Rushmore Conference: Strategies in the Prevention of Enteric Disease and Dissemination of Food-Borne Pathogens, Rapid City, SD, invited presentation, September 29/October 1

Vaccination on the Ranch as an Intervention Strategy to Reduce the Probability of Detecting *E. coli* O157:H7 Associated with Commercial Feedlot Cattle

Peterson RE, Paterson JA, Smith DR, Moxley RA, Klopfenstein TJ, Erickson GE, Choat WT and Hinkley S. 2005. Western Section of the American Society of Animal Science, New Mexico State University, Las Cruces, NM, poster/abstract 83, June 22-24

What We've Learned About Surveillance and Control of *Escherichia coli* O157:H7 in Feedlot Cattle

Smith DR. 2005. Epidemiologic Approaches for Food Safety Principal Investigators Meeting, USDA/CSREES, Washington, DC, October 6

Why have a Tracking System?

Smith DR. 2005. Nebraska 2005 Beef Feedlot Roundtable, Grand Island, NE, February 15

NATIONAL

Cattle Management Impact on Food Safety

Griffin DD. 2005. NCBA, San Antonio, TX, February 3

Pre-Harvest Antibiotic Residue Testing

Griffin DD. 2005. FDA-CVM, Rockville, MD, March 3

Quality Assurance and Interface Between the Public and Private Sectors

Griffin DD. 2005. USDA-APHIS Veterinary Services Conference, Des Moines, IA and Texas, June 7

REGIONAL

Cattle Health 101: Understanding & Outcome YA Little About Vaccines, Immunity, Herd Health Programs, Lung Scoring to Estimate the Cost of BRD, Estimating the Value of Your Professional Recommendations, Antibiotic Selection

Griffin DD. 2005. Building Treatment PR, Oklahoma State University, College of Veterinary Medicine, Stillwater, OK, June 3

Value of the General Veterinary Practitioner ..., Antibiotic Selection and Use ..., Vaccination Programs for Cattle ..., Applied Biosecurity ..., Nutrition 101 for Veterinarians ....

Griffin DD. 2005. Auburn Veterinary Conference, Auburn, AL, April 7

STATE

Impact of Nutrition and Mineral Supplementation on Herd Health

Griffin DD. 2005. Iowa State University, Cow Calf Conference, Ames, IA, February 25

56th Annual American College of Veterinary Pathologists Meeting, Boston, Massachusetts

Spontaneous Colitis of Tamarins Kept in a Zoo Exhibit is Associated with Multiple Phylotypes of Enterohepatic *Helicobacter* Species

Duhamel GE, Mercado JA, Lu G, Stryker CJ, Steffen DJ and Armstrong DL. 2005. 56th Annual American College of Veterinary Pathologists Meeting, Boston, Massachusetts, December 3-7

85th Annual Meeting Conference Research Workers in Animal Diseases, St. Louis, Missouri

Characterization of Protection Against Replication of Bovine Viral Diarrhea Virus Type 2 in Calves with a Modified-Live Noncytopathic Bovine Viral Diarrhea Virus Type 1 Vaccine

Hunsaker BD, DJ Steffen, CL Topliff, KM Eskridge and CL Kelling. 2005. 85th Annual Meeting Conference of Research Workers in Animal Disease in St. Louis, MO

Characterization of the Influence of N^{PRO} on the Virulence of Noncytopathic Bovine Viral Diarrhea Virus in Calves

Henningson JN, Steffen DJ, Topliff CL, Donis RO and Kelling CL. 2005. 85th Annual Meeting Conference of Research Workers in Animal Diseases, St. Lous, MO

Disruption of Enterotoxin Genes of Enterotoxigenic *Escherichia coli* by Allelic Exchange Using Lambda Red-Mediated Recombineering

Erume J, EM Berberov and RA Moxley. 2005. 85TH Annaul Meeting Conference Research Workers in Animal Diseases, St. Louis, MO, poster/abstract P46a, December 4-6

Influence of Mutations in the 5' Untranslated Region Internal Ribosomal Entry Site and the N^{PRO} Coding Region on *in vivo* Translational Efficiencies of Bovine Viral Diarrhea Virus Genotype 2 Isolates

Topliff CL, Chon SK, Donis RO, Eskridge KM and Kelling CL. 2005. 85th Annual Meeting Conference of Research Workers in Animal Disease in St. Louis, MO

Role of the Tir Protein in *Escherichia coli* O157:H7 Intestinal Colonization of Adult Cattle

Bretschneider G, EM Berberov and RA Moxley. 2005. 85th Annual Meeting Conference of Research Workers in Animal Diseases, St. Louis, MO, poster/abstract P46, December 4-6

The Cytolethal Distending Toxin B Sub-Unit of *Helicobacter hepaticus* Localizes to the Nucleus and is the Main Determinant for Intoxication of Eukaryotic Cells

Dassanayake RP and Duhamel GE. 2005. 85th Annual Meeting Conference Research Workers in Animal Diseases, St. Louis, Missouri, P52, poster presentation, December 4-6

The US Porcine *Campylobacter coli* are Negative for Cytolethal Distending Toxin Activity

Dassanayake RP, Stryker CJ, Johnson RK, Gebhart CJ, Post KW, Hinkley S, Muraoka WT, Wesley IV and Duhamel GE. 2005. 85th Annual Meeting Conference Research Workers in Animal Diseases, St. Louis, Missouri, P22, poster pressentation, December 4-6

105th General Meeting of the American Society for Microbiology, Atlanta, Georgia

Development of Molecular Genetic Approaches to Study MAP Pathogenesis

RG Barletta. 2005. 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia, June 8

Intracellular Trafficking of *Mycobacterium avium* subsp. paratuberculosis in Bovine Macrophages

NB Harris, O Chacon, DK Zinniel, Y Zhou and RG Barletta. 2005. 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia, June 8

Purification of the D-Alanine Ligase of *Mycobacterium* Tuberculosis from Overexpressing *Escherichia coli*

O Chacon, Z Feng, T Realpe, J Robledo, C Cassidy, J Sacchettini and RG Barletta. 2005. 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia, June

The Cytolethal Distending Toxin B Subunit of *Helicobacter hepaticus* is a Nuclear Localizing Ca^{2+}- and Mg^{2+}-Dependent Endonuclease

Dassanayake RP, Griep MA and Duhamel GE. 2005. 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia, abstract B-008/poster presentation, June 5-9

38th Annual Convention of the American Association of Bovine Practitioners, Salt Lake City, UT

An Estimate of the Proportion of Beef Cattle Herds with *Mycobacterium avium* spp. paratuberculosis-Infected Cattle and Associated Risk Factors

Smith DR, Schomer TJ, Hinkley S, Clowser S, Galeota JA, Weiss JC and Akin KJ. 2005. 38th Annual Convention of the American Association of Bovine Practitioners, Salt Lake City, UT, September 24

SELECTED COMMITTEE, EDITORIAL AND OTHER APPOINTMENTS

Raúl G. Barletta

Radiation Safety Committee, University of Nebraska-Lincoln, March 2000-present
Graduate Committee, Member, August 2004-present
Peer Review Committee, Member, October 2005-present
Book Chair, Department of Veterinary and Biomedical Sciences, September 1997-present
Adjunct Professor, School of Biological Sciences, September 17,1997-present
Member, Microbiology GREG, September 17, 1997-present
Member, Center for Redox Biology, University of Nebraska-Lincoln, 2002-present
Chair, Biomedical Sciences Group, LSIGRP (Life Sciences Interdisciplinary Graduate Recruitment Program)
Reviewer, Infection and Immunity
Reviewer, Journal of Clinical Microbiology
Department Head (Veterinary and Biomedical Sciences) Search Committee, Spring 2005-present
Ad-hoc Panel Member, NIH, Center for Scientific Review, AIDS-associated Opportunistic Infections and Cancer (AOIC) Study Section, July 2005-present

Bruce W. Brodersen

2005 Departmental Curriculum Committee
2004 - -2005 Ad Hoc BVD Committee for Academy of Veterinary Consultants
2004 B 2005 Committee for Immunohistochemistry Quality Control, American Association of Veterinary Laboratory Diagnosticians
2003 B 2004 Vice Chancellor=s Task Force on the Nebraska Veterinary Student Contract
2004 Veterinary School Student Selection Committee, Chairman
Public Relations Committee, Nebraska Veterinary Medical Association, 2000-2005
Chair, George A. Young Swine Health and Management Conference, 2001-2005
Responsible for annual submission of cases to the Armed Forces Institute of Pathology for participation in the Wednesday Slide Conference.
Responsible for maintaining and continued updating of the collection of histopathology slides from the Armed Forces Institute of Pathology in Washington, DC

Michael P. Carlson

IANR Pesticide Advisory Committee, 1997 to present

CASNR Recruitment, Retention and Placement Committee, Aug 2003 - present

VBMS Curriculum Committee, Jan 2005 – present

NATIONAL

Submitted 10 questions to the ACVP Board Examination Committee for use in the 2005 ACVP examination in anatomical pathology
Review Committee, Journal of Swine Health and Production, Swine Diseases and Diagnostic Notes
Ad Hoc Reviewer, Canadian Journal of Veterinary Research
Ad Hoc Reviewer, Journal of Virological Methods

STATE

University Liaison Committee, Nebraska Veterinary Medical Association
Pseudorabies Advisory Committee: ex-official member
Student Mentor, Nebraska Pork Producers Association

UNIVERSITY

Dissertation reviewer for the 2006 University of Nebraska-Lincoln Folsom Distinguished Dissertation Award
ISU-UNL Veterinary School Liaison Committee
New Student Enrollment
CASNR Day 11/5/05

DEPARTMENTAL

UNL Pre-Vet Scholarship Selection Committee Chairman
NVMA State Fair Birthing Pavilion

OTHER ACCOMPLISHMENTS IN 2005

Permission to use a number of my photographs and photomicrographs were requested by the new editor (Dr. James Zachary, College of Veterinary Medicine, University of Illinois) of Thompson's Pathological Basis of Veterinary Disease. I gave the editor blanket authority to publish any of my photographs he needed for illustration purposes in the upcoming edition. He was particularly interested in obtaining gross and microscopic photographs of swine and cattle diseases.

- Associate Editor, Microbiology, Society for General Microbiology, United Kingdom, 2004-2009
- Panel Member, NIH, United States Department of Health and Human Services, Center for Scientific Review:
  - Special Emphasis Panel
    July 7-8, 2005, ZRG1 IDM-A 90S, Bacterial Pathogenesis
    October 20-21, 2005, ZRG1 IDM-A 90S, Bacterial Pathogenesis
- Panel Member, Natural Sciences and Engineering Research Council of Canada, Integrative Animal Biology Grant
  Selection Committee 2004-2007
- United States Food and Drug Administration, Center for Veterinary Medicine
  Invited Expert Consultant, White Paper titled "Comparison of Two*Brachyspira pilosicoli* Challenge Models for Evaluation of the Efficacy of In-feed Valnemulin Hydrochloride for Control of Porcine Colonic Spirochetosis", on behalf of Novartis Animal Health US, Inc., May 2005
- National Committee for Clinical Laboratory Standards (NCCLS), Veterinary Antimicrobial Susceptibility Testing
  (V-AST) Sub-committee, Advisor/Observer (2001-present)
- Bacteriology/Mycology Committee, Anaerobic Techniques Sub-committee, American Association of Veterinary
  Laboratory Diagnosticians, Member (1996-present)
- NC-1007 Technical Committee on Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety, Nebraska Agriculture Experiment Station, Co-representative (1988-present)
- *Ad Hoc* Reviewer, USDA, National Research Initiative, Functional Genomics of Agriculturally Important
  Organisms Program, Microbes Subsection
- *Ad Hoc* Reviewer for Peer-reviewed Scientific Journals
  - Journal of Clinical Microbiology
  - Anaerobe
  - Avian Pathology
- UNL Institutional Biosafety Committee, Member (1995-present)
- UNL Institutional Animal Care and Use Committee, Member (2000-present), Chair (2003-2004)
- UNL Search Committee, Clinical Veterinarian, Institutional Animal Care Program, Member (2005)
- UNL, Animal Research Facility Renovations Advisory Committee, Member (2005)
- UNL, Microbiology Initiative Steering Committee, Member (2001-present)
- UNL, Center for Biotechnology, Microscopy Core Facility Advisory Committee, Member (2002 - present)
- IANR, Agricultural Research Division Advisory Council, Member (2002-05)
- Departmental Peer Review Committee, Chair (2005), Member (2002-2008)
- Department of Veterinary and Biomedical Sciences Head Search Committee, Member (2004-2005)
- Integrative Biomedical Sciences and Veterinary and Biomedical Sciences Graduate Committee Chair (2005-2008), Member (2003-2008)
- Departmental Undergraduate Research Coordinator (2004-2005)
- Veterinary Basic Science Glassware Cleaning and Sterilization Facility Supervisor (2001-present)

Dicky D. Griffin

- National Cattlemen's Beef Association, Beef Quality and Safety Taskforce
- Academy of Veterinary Consultants, Chairman Standards of Practice Committee
- Reviewer for the American Journal of Veterinary Research
- Reviewer for the Journal of the American Veterinary Medical Association
- Reviewer for the American Association of Bovine Practitioner

Clinton J. Jones

- Reviewed manuscripts for Journal of Virology (3), Journal of Neurovirology (3), and Journal of Clinical Microbiology (2), Journal of General Virology (1), Journal of Chemico-Biology Interactions (2)

- Currently serving on 11 Graduate Students PhD Supervisory Committees
- Assistant Director, Nebraska Center for Virology; November 2002-present
- Organized the annual Inter-campus Virology Meeting

Clayton L. Kelling

Chair (2000,2001,2004), Member (1996-02, 2003-06), VBMS Peer Review Committee
Chair (2000,2001,2004), Member (1996-02, 2003-06), VBMS Promotion and Tenure Committee
Member (2004-07), IBMS Graduate Committee.
Member (1993-present), VBMS Curriculum Committee
Member (2003-05), CASNR Curriculum Committee
Member, Nebraska Center for Virology
Treasurer(2005-2006), Nebraska Chapter of Gamma Sigma Delta
Reviewer for *American Journal of Veterinary Research, Vaccine, Virology, Journal of Virological Methods*

ORGANIZER AND SESSION CHAIRMAN OF MEETINGS/CONFERENCES

- Co-chaired the session of Protection against cell death in the lens; and Panelist of the Panel Session at the ARVO, Fort Lauderdale, FL, May 1-5, 2005
- Co-chaired the Oxiation and Antioxidant at the US-Japan Cooperative Cataract Research Group Meeting, Oct 29-Nov 2, 2005, at Kona, Hawaii
- Organizer of the conference for the ACRC conference, Beijing, China, June 3-7, 2005

REVIEWER FOR MANUSCRIPTS IN 2005

- Aldose reductase deficiency prevents diabetes-induced blood retinal barrier breakdown, apoptosis and glial reactivation in the retina of db/db mice. Cheung A. K-H. et al. Diabetes, 2005
- Impact of smoking and age on the integrity and oxidant status of cataractous lens by Reeni A., et al. Clinical and Experimental Ophthalmology, 2005
- Molecular characterization of the cystine/glutamate exchanger (Xc) and the excitatory amino acid transporters (EAATs) in the rat lens byLim J. et al. Investigation Ophthalmology Visual Science, 2005
- Manganese superoxide dismutase protects against oxidation-induced apoptosis in mouse retinal pigment epithelium:implications for age-related macular degeneration by Kasahara, E. et al., Investigation Ophthalmology Visual Science, 2005
- Calcium-Activated RAF/MEK/ERK Signaling Pathway Mediates p53-Dependent Apoptosis and Is Abrogated by alphaB-Crystallin through Inhibition of Ras Activation" by Li, D. W-C. et al., Molecular Cellular Biology, 2005
- Iodine restores lens glutathione level in selenite-induced cataracts of rat pups by Winkler et al., ophthalmologia, 2005
- Cumulative antioxidant defense against oxidative challenge in galactose induced cataractogenesis in Wistar rats, by Raju et al. Experimental Eye Research, 2005
- Calpain splice variant Up84 in human eyes. Ma, H. et al., Experimental Eye Research, 2005
- Protective effect of aspirin against dexamethason-induced cataract in cultured rat lens by Yan, H. et al., Ophthalmic Research, 2005

DEPARTMENTAL COMMITTEES

- Chairperson, Space Utilization Committee, 1998-present
- Graduate Student Committee Member for the Center for Biological Chemistry Program, 2001-2005

UNIVERSITY

- Appointed Member of the Women's Council, University of Nebraska System, 2004-2006

SCIENTIFIC COMMUNITY

- Organizer of the 6th Asian Cataract Research Conference, ACRC, Beijing, China, 2006
- Elected Member of the Board of Trustees for the National Foundation for Eye Research, 1998-present
- Elected North America Program Member for Lens Section, European Eye Research Meeting, 2001-2002, re-elected for 2003-2005
- Elected chairman of the council of Membership Committee for North America, International Society of Eye Research, 2004-2007

- Editorial Board, *Infection and Immunity*, American Society for Microbiology Press, 1-1-96/12-31-07, four consecutive three-year terms
- Ad hoc reviewer, Applied and Environmental Microbiology, American Society for Microbiology Press, 2003
- Ad hoc reviewer, Journal of Clinical Microbiology, American Society for Microbiology, 2003
- Ad hoc reviewer, Microbiology, 2004
- Ad hoc reviewer, Journal of Veterinary Diagnostic Investigation, 2004
- Ad hoc reviewer, USDA-CSREES-NRICGP, Area 44.0 Sustaining Animal Health and Well-Being, 2003
- Ad hoc reviewer, USDA-CSREES-NRICGP, Area 32.0 Food Safety, Ad hoc reviewer, 2003
- Ad hoc reviewer, University of Idaho, Research Grants Program, 2003
- Member, UNL Institutional Biosafety Committee, 1-27-03/12-31-05
- Member, Curriculum Committee, UNL Department of Veterinary & Biomedical Sciences, 9-1-02/present, Chair, 1-1-03-present
- Curriculum Committee, UNL, College of Agricultural Sciences and Natural Resources, Member, 8-1-01/7-31-03
- UNL Department of Veterinary & Biomedical Sciences, Peer Review Committee, Member & Chair, 10-1-02/7-1-04, appointment ended when became Interim Head
- CASNR Faculty Advisory Council, Member, 7-1-03/6-30-05
- Academic Senate, University of Nebraska-Lincoln, Member and Departmental Representative, 5-1-04/4-30-06
- Member, St. Elizabeth Regional Medical Center Research Council, 9-03/7-06
- Member, Agricultural Advisory Committee, Jeff Fortenberry, Candidate for U.S. Congress, 1st District, Nebraska, 2004
- Grant Review Panel Member, USDA, National Research Initiative Competitive Grants Program, Epidemiological Approaches for Food Safety, Area 32.1, 2004
- Member, Kansas State University College of Veterinary Medicine Admissions Committee for Nebraska Residents, 10-1-95/9-30-98
- Grant Review Panel Member, USDA, National Research Initiative Competitive Grants Program, Animal Health and Well-Being 44.0, 1998-1999
- UNL Agricultural Research Division Advisory Council. District 6 Representative, 7-1-96/6-30-99, Secretary 7-1-98/6-30-99
- UNL Institutional Animal Care and Use Committee, Member, 8-88/12-31-94, Chair 1-1-91/12-31-92
- UNL Institutional Research and Laboratory Animal Care Subcommittee, Member, 1989-91, 1992-1994
- Lincoln-Lancaster County Health Department Infectious Waste Task Force, Member, 1990-91
- George A. Young Swine Conference Planning Committee, Member, 1984-86; Member, 1987-88, Chair; 1990-91; Member, 7-1-95/6-30-96
- Nebraska SPF Health Advisory Committee, Member, 1985-1988
- UNL College of Agriculture Curriculum Committee, Member, 1988-1990
- UNL Department of Veterinary Science Peer Review Committee, Member, 1986-1988
- USDA-CSREES Regional (Multi-State) Research Technical Committee, Nebraska Station Representative: NC-62 Enteric Diseases of Swine, 10-1-83/9-30-97, NC-62 Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety, 10-1-97/9-30-02, Chair in 1996-97 and led the re-write for the 1997 renewal; NC-1007 Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety, 10-1-02/9-30-07

Fernando A. Osorio

- International Veterinary Advisory Board, Pig Improvement Corporation, 2001- present
- Lead Reviewer (2005-2008) Journal of Swine Health and Production , AASV
- Ad Hoc Reviewer for Virology, Jouornal of General Virology and Virus Research
- External Reviewer of promotion files for faculty at: Oklahoma State University, Cornell University and Iowa State University
- Nebraska Representative to the NC 229, PRRSV Research, Multi-State Project

Asit K. Pattnaik

- Ad hoc reviewer, Experimental Virology Study Section, NIH, October 2002
- Member, Special Study Section, Bio-terrorism and Emerging Viruses, NIH, July 2003
- Ad hoc reviewer, AIDS and Opportunistic Infections and Cancer Study Section, NIH, November 2005
- Reviewed manuscripts submitted for publication in J. Virol., Proc. Natl. Acad. Sci., USA and Virology

Douglas G. Rogers

- American Association of Veterinary Laboratory Diagnosticians
  Committee on Enteric Diseases
- Nebraska Veterinary Medical Association:
  Chair, Professional & Consumer Relations Committee
- Student Scholarship Committee
  University Liaison Committee
- Nebraska Livestock Emergency Disease Response System (LEDRS)
- Certified emergency responder
- Peer Review Committee 2004-2005
- Co-Advisor, UNL Pre-Veterinary Club

Gary P. Rupp

- Nebraska College of Technical Agriculture Advisory Committee
- South Central Cattleman, Board of Directors
- Journal of Theriogenology Ad Hoc Reviewer
- Nebraska Veterinary Student Selection Committee
- National Cattlemen's Beef Association - Production Research Committee

David R. Smith

- President, Epidemiology Specialty, American College of Veterinary Preventive Medicine, 2005-2007
- Panelist: USDA CSREES NRI Competitive Grants Program, 44.0 Animal Protection, Panel C, 2005
- Steering Committee. Alliance for Bovine Health, 2005
- Steering Committee on Antimicrobial Resistance, American Veterinary Medical Association, 2004-2005
- Food Safety Advisory Committee, American Veterinary Medical Association, 2005-2006
- Food Quality, Safety, and Security Committee, American Association of Bovine Practitioners, 1999-present
- Co-manager, AABP-L listserve, American Association of Bovine Practitioners, 1999-present (1750+ subscribers from 60+ countries)
- Scientific program planning committee, American Association of Extension Veterinarians, 2005
- Board of Directors, Nebraska State Dairymen's Association, 2000-present
- Nebraska Bureau of Animal Industry, Johne's Disease Advisory Committee, 1998-present
- Search Committee, Department Head of the Department of Veterinary and Biomedical Sciences, University of Nebraska, 2003-2005
- Chair, Search Committee. Veterinary Epidemiologist, Department of Veterinary and Biomedical Sciences, University of Nebraska, 2003-present

AD HOC REVIEWER FOR

- *Manuscripts*
- Antimicrobial Agents and Chemotherapy
- Biotechnology and Bioengineering
- Infection and Immunity
- Journal of Bacteriology
- Journal of Clinical Microbiology
- Molecular Microbiology
- Nature Reviews Microbiology

Greg A. Somerville

GRANTS

- National Science Foundation

COMMITTEES

- Life Sciences Interdisciplinary Graduate Recruitment Program Admissions Committee
- VBMS Graduate Education Committee
- Search Committee for Diagnostic Microbiologist

APPOINTMENTS AND AFFILIATIONS

- Department of Biochemistry, UNL
- Redox Biology Center, UNL
- Department of Pathology and Microbiology, UNMC
- Center for Bacterial Pathogenesis Research, UNMC
- Departmental Peer Review Committee, 1996 elected 2000; re-elected 2003-2006
- Social Committee 1997-2000

- VBMS Search Committees, Chair, Poultry Veterinarian Search Committee; Microbiologist Search Committee, 2002; Department Chair Search Committee, 2004-2005; Bacteriologist Search Committee, Chair, 2005
- Curriculum Committee 2003-present
- Curriculum Committee Chair 2005
- Ad Hoc Reviewer for Veterinary Pathology, 1995-present
- Associate Editor, Journal of Veterinary Diagnostic Investigations, 1996-present
- AAVLD By-Laws Committee Member 1997-2001, Chair 2002 -2005, 2006-2009
- Publications Committee 1998-present, Chair 2001-2006, Program Committee 2000-present
- Director's Committee 2000-present, Executive Board 2005-2008

DEPARTMENT OF VETERINARY AND BIOMEDICAL SCIENCES
ARTICLES REGARDING THE DEPARTMENT, 2005

"Students Help with Testing of Deer," Scarlet, January 6, 2005, pg 1

"Sandhills calving system," Drovers, February 2005, pg 13

"Scour Proofing: Preventive Approach Can Reduce Losses Due to Calf Scours," Drovers, February 2005, pgs 24-25

"UNL Undergrads Experience Research Firsthand Working with Agricultural Scientists," IANR News, April 15, 2005

"Identifying Feedlot Lameness, Part 1," Bovine Veterinarian, pgs 4-12, May-June 2005

"Closed Border May Mean Less Money for Nebraska Cattle Producers in the Long Run," IANR News, May 26, 2005

"Bug Experts Work Crime Scenes for Insect Clues," Universal Information Services, Inc., Daily News, Norfolk, NE, March 5, 2005

"Students help with sample testing," Universal Information Services, Inc., Seward County Connection, Seward, NE,

"Swine Conference Addresses PRRS Management, Eradication," IANR News, July 11, 2005

"Mitigating Feedlot Lameness," Bovine Veterinarian, pgs. 14-20, July/August 2005

"Smith Honored for Animal Production Food Safety Education, Research," IANR News, July, 2005

"The ear is a busy place," Bovine Veterinarian, pg. 27, October 2005

"More Arrows in the Quiver;" Beef Industry Works to Expand the List of *E. coli* Interventions; pg 28, Drovers, October 2005

"Use Pharmacology to Select BRD Therapy," Bovine Veterinarian, November-December 2005, pgs 4-9

Departmental Budget Summaries
Department of Veterinary and Biomedical Sciences

Table 13. Budget, Veterinary and Biomedical Sciences Department, Fiscal Year 2005

FY Budget	FTE*	Personnel	Benefits	Operating	Totals
Teaching	8.78	491,142	117,633	94,021	**702,796**
Research	51.69	2,748,889	636,011	140,147	**3,525,047**
Extension	2.93	192,121	68,715	27,937	**288,773**
TOTAL	**63.40**	**3,432,152**	**822,359**	**262,105**	**4,516,616**

*Includes faculty and staff

Table 14. Summary of Other Income*

Source of Income	Amounts
Animal Health Funds	95,000
Multi-State Research Funds	52,500
Tobacco Research Funds	30,000
Grants Received	2,080,711
Research Revolving Income	59,849
Teaching Revolving Income	77,014
Extension Revolving Income	12,462
Diagnostic Revolving Income	1,687,965
Biotechnology Support	-0-
TOTAL	**4,095,501**

*Includes AOC funds

Table 15. Nebraska Veterinary Diagnostic Laboratory System Revolving Account Summary for FY 2005

LINCOLN DIAGNOSTIC LAB (VDC)			
Income	Personnel Expense	Operating Expense	Balance
1,687,965	432,408	1,074,407	181,150

Table 16. Summary of Research Funds* Allocations to Veterinary and Biomedical Sciences Department by Agricultural Research Division for Fiscal Year 2005 and Comparison to Average for 20 IANR Administrative Units**

Characteristics	Veterinary & Biom Sci	ARD Average
Faculty research FTE	9.20	6.87
Faculty salary, $/FTE	110,540	91,882
Manager/Prof employ., fte/FTE	0.42	0.68
Manager/Prof salary, $/FTE	16,840	25,697
Office/Service employ., fte/FTE	0.59	0.69
Office/Service salary, $/FTE	14,578	20,234
GRA stipends, $/FTE	23,854	15,571
Hourly employees wages, $/FTE	6,440	2,153
Frienge benefits, $/FTE	37,269	36,810
Operating, $/FTE	27,714	22,396
Total support, $/FTE	126,694	122,860
Total investment, $/FTE	**237,234**	**214,743**

* Summary includes State, Hatch, Federal Animal Health Research Formula Funds, (Section 1433) and USDA CSRS North Central Regional Research Funds. Does not include revolving, grant and contract funds or Veterinary Diagnostic Center or Great Plains Veterinary Educational Center budgets.

** Data compiled by IANR Agricultural Research Division.

Table 17. UNIT PERFORMANCE CHARACTERISTICS

VETERINARY & BIOMEDICAL SCIENCES UNIT PERFORMANCE CHARACTERISTICS[1]				
Characteristic	**FY 2004**		**Average of FY 2002-2004**	
	VBS	**ARD Ave.**	**VBS**	**ARD Ave.**
Total Approp. $/FTE[2]	234,836	210,420	221,176	204,978
Ref. Publications/FTE[3]	2.90	4.56	2.83	4.09
Theses/FTE[4]	1.45	1.23	1.10	1.07
Competitive Grant $/FTE	328,007	98,081	259,750	92,368
Total Grant $/FTE[5]	345,790	159,641	307,133	157,574
Total Grant $/Total Approp $	1.472	0.788	1.380	0.806
Compet. Grant Proposals/FTE	1.00	0.80	2.04	1.30
Total Grant Proposals/FTE	3.46	4.72	5.33	6.88
Total Resources, $/FTE	**580,626**	**370,056**	**528,309**	**362,554**

[1] Data taken from ARD budgets, ARD Annual Reports and Summary of grants prepared by Office of Sponsored Programs.

[2] Data reflects Unit appropriated budget plus RRF, McIntire Stennis, Animal Health and funds added to unit during fiscal year.

[3] Publications included journal articles, book, book chapters and research bulletins.

[4] Theses include MS theses and PhD dissertations.

[5] Includes proposals to all funding agencies (federal and state agencies, commodity boards, UN Foundation, corporations and internal grant proposals).

Table 18. Research Grant and Contract Income During the Last Four Calendar Years Expressed on Dollars Per Research FTE Basis*

Unit	2001	2002	2003	2004	Average 2001-2004
Agricultural Economics	12,903	19,490	14,906	11,901	14,800
Ag Leadership, Ed & Communications	8,381	-0-	-0-	725	2,277
Agronomy & Horticulture	166,655	103,434	181,844	164,078	154,003
Animal Science	139,655	114,218	61,979	98,619	103,618
Biochemistry	292,905	462,158	541,412	751,099	511,894
Biological Systems Engineering	141,065	61,571	35,049	107,260	86,236
Entomology	123,257	133,919	151,858	63,361	118,099
Family & Consumer Science	14,021	-0-	-0-	94,340	27,090
Food Science & Technology	381,421	538,807	360,828	263,481	386,134
Natural Resources	407,086	224,001	365,215	300,768	324,268
Northeast R&E Center	54,760	49,595	91,443	90,853	71,663
Nutritional Science & Dietetics	248,501	72,187	163,083	78,224	140,498
Panhandle R&E Center	104,646	128,767	121,189	140,551	123,788
Plant Pathology	164,151	173,741	246,810	324,585	227,322
Statistics	1,101	63,515	22,532	17,358	26,127
Textiles, Clothing & Design	127,103	67,578	319,636	-0-	128,579
Veterinary & Biomedical Sciences	100,924	337,777	420,639	234,536	273,469
West Central R&E Center	48,050	49,996	32,173	53,868	46,022
AVERAGE	**137,778**	**139,406**	**173,922**	**155,312**	**153,660**

* Grants obtained by interdisciplinary center and the ARD Dean's office are not listed. These funds are largely expended by faculty in academic units. Therefore, the listing is not a completely accurate representation of all external funds available for faculty use.

Table 19. RESOURCE AND PERFORMANCE TRENDS

UNIT: VETERINARY & BIOMEDICAL SCIENCES

(INCLUDES GPVEC)

	FISCAL YEAR													
INDICATOR	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Research FTE	9.13	8.98	7.55	7.81	7.41	5.46	6.96	8.93	10.88	10.88	10.65	9.30	8.96	9.20
Approp. $/FTE [1/]	147,671	156,233	197,394	194,459	211,145	281,495	239,044	189,151	184,216	195,222	204,596	224,097	234,836	237,234
Comp. Grant $/FTE	33,954	33,686	56,131	92,978	165,027	131,558	133,955	102,289	93,830	229,038	181,123	270,121	328,007	
Total Grant $/FTE	64,891	54,003	94,388	164,400	250,806	241,423	229,064	133,224	160,688	265,037	232,717	342,892	345,790	
Grant $/Approp. $	0.439	0.346	0.478	1.92	1.188	0.858	9.958	0.704	0.87	1.358	1.137	1.530	1.472	
Total Resources, $/FTE	212,562	210,236	291,782	358,859	462,011	522,918	468,108	322,375	344,904	460,259	437,313	566,989	580,626	
Ref. Pubs/FTE	2.52	2.44	3.18	2.56	2.29	2.56	3.45	2.58	1.19	3.48	1.60	3.98	2.90	
Theses/FTE	0.11	1.34	0.93	1.28	1.35	2.20	1.44	0.90	0.92	0.37	0.66	1.18	1.45	
Comp. Proposals/FTE [2/]	1.64	1.78	2.91	1.92	1.21	1.47	1.72	1.90	1.65	1.65	2.44	2.69	1.00	
Total Proposals/FTE [3/]	**9.85**	**9.69**	**12.32**	**9.35**	**8.50**	**9.34**	**4.89**	**8.40**	**7.17**	**6.89**	**7.04**	**5.48**	**3.46**	

[1]/Includes state and federal formula funds plus additional resources added to units on a nonrecurring basis. Does not include administrative "overhead," diagnostic laboratories, or general support of ARDC or interdisciplinary centers.
[2]/Proposals submitted to federal agencies with competitive grant programs.
[3]/All grant proposals including those submitted to commodity boards, industry and university internal grant competition.

Table 20. Nebraska Cash Receipts* from Farm Marketings by Commodity, 2004**
Total All Commodities = $11,779,728

LIVESTOCK PRODUCTS			CROPS		
Commodity	$ Value in Thousands	% of Total	Commodity	% Value in Thousands	% of Total
Livestock & Products	7,338,183	62.3	Food Grains	218,753	***
Meat Animals	6,970,380	***	Rye	***	***
Cattle & Calves	6,196,896	52.6	Wheat	217,810	1.8
Hogs	761,953	6.5	Millet, Proso	9,852	0.1
Sheep & Lambs	11,531	0.1	Feed Crops	2,719,244	***
Dairy Products	168,480	1.4	Oats	2,555	0.0
Milk, Wholesale	168,480	***	Barley	427	0.0
Poultry & Eggs	171,747	***	Corn	2,543,705	21.6
Broilers	11,430	0.1	Hay	102,187	0.9
Farm Chickens	17	0.0	Sorghum Grain	60,519	0.5
Chicken Eggs	138,863	1.2	Oil Crops	1,287,932	***
Other Poultry	970	***	Soybeans	1,280,621	10.9
Misc. Livestock	25,576	***	Sunflower	***	***
Honey	4,857	0.0	Vegetables	117,456	***
Wool	258	0.0	Dry Beans	64,479	0.5
Other Livestock	22,000	***	Potatoes, Fall	42,977	0.4
Crops	4,441,545	37.7	Other field Crops	25,000	***
Other Berries	140	0.0	Misc. Vegetables	10,000	***
Other Seeds	1,000	0.0	Greenhouse/nursery	34,300	0.3
Fruits & Nuts	1,440	0.0	All Other Crops	96,720	***
Misc Fruits & Nuts	1,300	0.0	Net Farm Income	3,459,064	***
Sugar Beets	36,420	0.3			
Other Field Crops	25,000	***			

* Data from Nebraska Agricultural Statistics
** Most current data available
*** Data not available

Table 21. Nebraska Agriculture - Rank in Agribusiness Facts (April 2005)*,**

Rank, Commodity and Date	Number	Units	% of US Total
1st Commercial livestock slaughter, live weight, 2004	10,668,004,000	*Pounds*	15.5
1st Commercial red meat production, 2004	6,800,000,000	*Pounds*	15.0
1st Commercial cattle slaughter, live weight, 2004	8,822,089,000	*Pounds*	21.7
1st Great Northern bean production, 2004	827,000	*Cwt.*	87.0
2st Commercial cattle slaughter, number, 2004	6,902,600	*Head*	21.1
2st Light red kidney bean production, 2004	174,000	*Cwt.*	21.5
2nd Cash receipts from all meat animals, 2003	6,526,691,000	*Dollars*	11.6
2nd Cash receipts from cattle and calves, 2003	5,903,957,000	*Dollars*	13.1
2nd Pinto beans production, 2004	1,196,000	*Cwt.*	15.3
2nd All cattle on feed, January 1, 2005	2,470,000	*Head*	18.0
3rd Total value of all cattle and calves, Janury 1, 2005	5,778,500,000	*Dollars*	6.6
3nd All dry edible beans production, 2004	2,376,000	*Cwt.*	13.3
3nd Proso millet production, 2004	3,375,000	*Bushels*	22.4
3rd Cash receipts from all feed crops, 2003	2,211,529,000	*Dollars*	9.1
3rd Cash receipts from corn, 2003	2,040,658,000	*Dollars*	11.1
3rd Cash receipts from sorghum grain, 2003	48,277,000	*Dollars*	5.7
3rd Cash receipts from livestock and livestock products, 2003	6,867,368,000	*Dollars*	6.5
3rd Net farm income, 2003	3,227,861,000	*Dollars*	5.4
3rd All cattle and calves, January 1, 2005	6,350,000	*Head*	6.6
3rd Fed cattle marketed (1,000+capacity lots), 2004	4,480,000	*Head*	20.1
3rd Corn for grain production, 2004	1,319,700,000	*Bushels*	11.2
3rd Sorghum for grain production, 2004	33,615,000	*Bushels*	7.4
4th Cash receipts from farm marketings, 2003	10,621,275,000	*Dollars*	5.0
4th Beef cows and heifers that have calved, January 1, 2005	1,909,000	*Head*	5.8
4th Land in farms and ranches, 2004	45,900,000	*Acres*	4.9
4th On-farm grain storage capacity, December 1, 2004	1,020,000,000	*Bushels*	9.1
4th Off-farm grain storage capacity, December 1, 2004	698,838,000	*Bushels*	8.2
5th Cash receipts from soybeans, 2003	1,089,591,000	*Dollars*	6.8
5th Cash receipts from all oil crops, 2003	1,095,798,000	*Dollars*	6.3
5th Calf crop, 2004	1,800,000	*Head*	4.8
6th Cash receipts from hogs and pigs, 2003	611,988,000	*Dollars*	5.8
6th Alfalfa hay production, 2004	4,438,000	*Tons*	5.9

Rank, Commodity and Date	Number	Units	% of US Total
6th Value of principal crops produced, 2004	4,425,553,000	*Dollars*	4.3
6th Soybean production, 2004	220,875,000	*Bushels*	7.0
6th Pig crop, 2004	6,204,000	*Head*	6.1
6th Commercial hog slaughter, live weight, 2004	1,845,711,000	*Pounds*	6.7
6th Commercial hog slaughter, number, 2004	6,953,300	*Head*	6.7
6th Value of all hogs and pigs on farms, December 1, 2004	313,500,000	*Dollars*	5.1
7th All hay production, 2004	6,143,000	*Tons*	3.9
7th Winter wheat proudtion, 2004	61,050,000	*Bushels*	4.1
7th All hogs and pigs, December 1, 2004	2,850,000	*Head*	4.7
7th Table eggs produced, 2004	3,174,000,000	*Eggs*	4.2
7th Sunflower production, 2004	52,150,000	*Pounds*	2.5
7th Harvested acreage, principle crops, 2004	18,261,000	*Acres*	6.0
7th Sugarbeet production, 2004	1,050,000	*Tons*	3.5
8th Sorghum silage production, 2004	225,000	*Tons*	4.7
8th Cash receipts from crops, 2003	3,753,907,000	*Dollars*	3.5
8th Cash receipts from sugarbeets, 2003	30,400,000	*Dollars*	2.8
9th Oat production, 2004	3,740,000	*Bushels*	3.2
10th Corn silage production, 2004	3,795,000	*Tons*	3.5
10th All wheat production, 2004	61,050,000	*Bushels*	2.8
10th Cash receipts from wheat, 2003	224,846,000	*Dollars*	3.3
10th Honey production, 2004	4,539,000	*Pounds*	2.5
11th All potato proudction, 2004	9,288,000	*Cwt.*	2.0
12th Cash receipts from all food grains, 2003	233,764,000	*Dollars*	2.9
12th All chickens, Decembe 1, 2004	13,972,000	*Head*	3.1
13th Cash receipts from hay, 2003	118,499,000	*Dollars*	2.7
14th Cash receipts from potatoes, 2003	47,885,000	*Dollars*	1.9
14th Cash receipts from chicken eggs, 2003	139,368,000	*Dollars*	2.6
14th Value of all chickens on hand, December 1, 2004	26,547,000	*Dollars*	2.4
15th Other hay (excludes alfalfa) production, 2004	1,705,000	*Tons*	2.1
15th Wool production, 2004	600,000	*Pounds*	1.6
18th All sheep and lambs, January 1, 2005	97,000	*Heads*	1.6
18th Value of wool production, 2004	258,000	*Dollars*	0.9

Rank, Commodity and Date	Number	Units	% of US Total
18th Number of farms, 2004	48,300	*Farms*	2.3
26th Barley production, 2004	162,000	*Bushels*	0.1

***/Data from USDA/NASS, Lincoln, NE; **/Most current data available**

Appendix

The 46th Annual George A. Young Swine Health and Management Conference

August 11, 2005

Conference Location
Marina Inn
Fourth & 'B' Street
South Sioux City, NE

University of Nebraska Lincoln

Sponsors
University of Nebraska-Lincoln
Institute of Agriculture and Natural Resources
Nebraska Cooperative Extension
Department of Veterinary and Biomedical Sciences

THE 46TH ANNUAL GEORGE A. YOUNG SWINE HEALTH AND MANAGEMENT CONFERENCE

August 11, 2005

"Achieving the Best of Production Through Knowledge"

MARINA INN
Fourth & B Streets
South Sioux City, Nebraska 68776

210

- *Swine Industry Economics*
- *Swine Diseases*
- *Production and Management Strategies*

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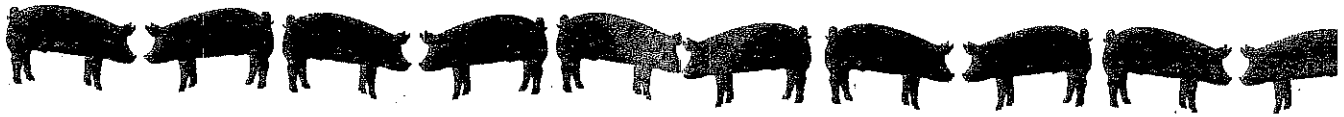


PROGRAM

8:00 am	*Registration (with coffee and rolls)*
8:25	*Welcome — Dr. Bruce Brodersen, Conference Chair*
8:30-9:30	*"The Science Behind PRRS Transmission and Biosecurity" — Dr. Scott Dee*
9:30-10:15	*"PRRS Eradication: Depopulation and Rollover Techniques" — Dr. Locke Karriker*
10:15-10:30	*BREAK*
10:30-11:15	*"An Update on Ongoing PRRSV Immunobiology Research" — Dr. Fernando Osorio*
11:15-12:00	*"Update on Coordinated Industry Efforts to Fund PRRS Education and Research" — Dr. Eric Neumann*
12:00 pm	*LUNCH*
1:00-2:00	*"Genetics of Disease Resistance: PRRS as a Model" — Dr. Rodger Johnson*
2:00-2:45	*"PRRS Eradication: Personal Experiences with PRRS Biosecurity, Monitoring, and Surveillance" — Dr. Joel Nerem*
2:45-3:30	*"Assessment of PRRS Risk for Swine Production Sites: Methods & Applications in Health Management" — Dr. Dale Polson*

The Conference has been approved for 5 1/2 hours of Nebraska Veterinary Continuing Education credits.

INTRODUCTION

Pork producers, large animal and swine practitioners, faculty in the animal and veterinary sciences, and industry representatives will benefit from this update of research and industry developments as they relate to modern swine production and technology.

The George A. Young Swine Conference has a long-standing tradition of providing up-to-date information on developments in research and production techniques as they relate to today's swine industry. Industry experts have come to respect this conference as their annual opportunity to communicate with colleagues, and to interact with others throughout the spectrum of swine research and production.

GUEST PARTICIPANTS

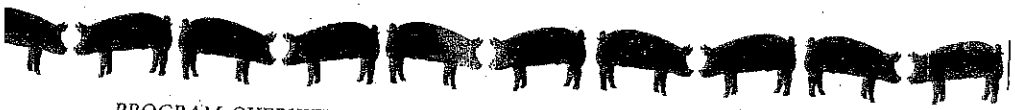
Dr. Scott Dee — Associate Professor, Department of Veterinary Population Medicine, University of Minnesota
Dr. Locke Karriker — Assistant Professor, Department of Veterinary Diagnostic and Production Animal Medicine, Iowa State University
Dr. Dale Polson — Senior Manager, Technical Resources, Boehringer Ingelheim Vetmedica, Inc.
Dr. Eric Neumann — Director of Swine Health Information and Research, National Pork Board
Dr. Joel Nerem — Veterinarian, Christensen Family Farms, Sleepy Eye, Minnesota

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES (IANR) AND UNIVERSITY OF NEBRASKA PROGRAM PARTICIPANTS

Dr. Bruce Brodersen — Associate Professor, Dept. of Veterinary and Biomedical Sciences, Veterinary Diagnostic Center, University of Nebraska; Lincoln, Nebraska
Dr. Rodger Johnson — Professor, Animal Science Department, University of Nebraska, Lincoln, Nebraska
Dr. Fernando Osorio — Professor, Department of Veterinary and Biomedical Sciences, University of Nebraska; Lincoln, Nebraska

PROGRAM COMMITTEE

Bruce Brodersen, Chair
Sharon Clowser, Conference Coordinator
Ron Brodersen, Whole Hog Health Center
Mike Brumm, University of Nebraska Haskell Agricultural Laboratory
Tom Buelt, Pfizer Animal Health
Larry Germer, Gage County Extension Educator
David Hansen, Producer
Phil Hardenburger, Crete Veterinary Clinic
Jeff Husa, Boehringer Ingelheim Vetmedica, Inc.
Jim Unwin, Red Barn Veterinary Clinic



PROGRAM OVERVIEW

The Science behind PRRS Transmission and Biosecurity" — Dr. Scott Dee

Dr. Dee will be discussing current research in the identification of indirect routes of PRRSV transmission, including a summary of biosecurity protocols designed to prevent spread via these routes. Special emphasis will be placed on aerosols, insects and transport; however, a comprehensive overview of PRRSV transmission will take place as well.

PRRS Eradication: Depopulation and Roll-over Techniques" — Dr. Locke Karriker

The purpose of this presentation will be to illustrate the steps required for successful application of these techniques and expectations for success. Comparisons will be made between the two processes with regards to pigs flow and production impacts.

n Update on Ongoing PRRSV Immunobiology Research" — Dr. Fernando Osorio

The availability of novel techniques based on reverse genetics is contributing significantly to better understand the genetic and structural basis of virulence of PRRS virus. We will discuss the applications of this new knowledge in obtaining a better understanding of PRRS pathogenesis and the possible applications to the development of new immunogens against the PRRS virus.

pdate on Coordinated Industry Efforts to Fund PRRS Education and Research" — Dr. Eric Neumann

Dr. Neumann will discuss an overview of current activities within the National Pork Board PRRS Initiative and the Coordinated Agricultural Project PRRS Grant. Completed and on-going research projects will be reviewed along with information on education and outreach objectives.

"Genetics of Disease Resistance: PRRS as a Model" — Dr. Roger Johnson

Results of an experiment in which pigs of two genetic lines were infected with PRRSV will be presented. Uninfected littermates served as controls. Discussion will include evidence for genetic variation in phenotypic responses and evidence from gene expression studies that identified certain immune function genes that are expressed differently in lungs between pigs of the two lines and between high and low responders to virus. Along with discussion and interpretation of the data, potential for selection for resistance will be discussed.

"PRRS Eradication: Personal Experiences with PRRS Biosecurity, Monitoring, and Surveillance" — Dr. Joel Nerem

This presentation will provide an overview of our system's approach to safeguarding high health production. Topics addressed will include our overall biosecurity philosophy, disease surveillance strategies, biosecurity of transport, and on farm biosecurity practices.

"Assessment of PRRS Risk for Swine Production Sites: Methods & Applications in Health Management" — Dr. Dale Polson

Clearly understanding and optimally managing the entire range of key PRRS risks is important to goal setting and planning a route to achieve a PRRS management goal and not go backwards. The veterinarian is in the best position to help producers assess and manage PRRS risks, but to do so effectively need standardized and validated tools to use as part of a logical and systematic health management plan for PRRS. These tools should be designed so as to help achieve consistent risk identification, measurement and enable appropriate risk management actions/interventions. Our purpose was to develop a process and standardized/validated tools to enable evaluation of the risk and contributing factors that may predispose individual farm sites to a higher probability of clinical PRRS episodes.

SPONSORS

We would like to thank the following sponsors for their support and contributions in making this Conference possible:

Alltech Nebraska
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American Association of Swine Veterinarians
Boehringer Ingelheim Vetmedica
Elanco Animal Health
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Nebraska Pork Producers Association
Pfizer Animal Health
Waldo Farms, Inc.

CANCELLATIONS

If you must cancel your registration, please notify us prior to August 1, 2005 in order to receive a full refund. Cancellations received after August 1, 2005 will be subject to an administrative charge of $10.00.

HOTEL RESERVATIONS

For those people needing hotel accommodations, a block of rooms has been reserved for the Conference at the Marina Inn, 4th and B Streets, South Sioux City, Nebraska, 68776. The rate for a single/double occupancy room is $79.00. To make your reservations, call 1-800-798-7980 or (402) 494-4000 and ask for rooms reserved for the George Young Swine Conference.

For further information, contact Sharon Clowser, Conference Coordinator, Department of Veterinary and Biomedical Sciences, 151 Veterinary Diagnostic Center, P.O. Box 830907, University of Nebraska-Lincoln, Lincoln, NE 68583-0907, phone 402/472-8550; FAX 402/472-3094; E-mail address: sclowser2@unl.edu

IANR

GEORGE A. YOUNG SWINE HEALTH & MANAGEMENT CONFERENCE

Registration Form

*Name*_____

*Address*_____

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State _____ *Zip* _____

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Conference Fees:

_____ *Pre-registration:* $ 65.00 per person
_____ $ 55.00 per person (Group of 3 or more)
_____ *At the door:* $ 85.00

One Proceedings will be provided with each paid registration. Please check the one you prefer.

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Additional Proceedings may be ordered.

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Registrations received after August 1, 2005 will be charged an additional $10.00.

Make checks payable to: University of Nebraska

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