

This project has been subsidised by the European Union's Agricultural Fund for Rural Development and the Danish Ministry of Food, Agriculture and Fisheries.

Third International Symposium on Mastitis and Milk Quality

Opening Session – Keynote Address

Quality Will Be Everything – But What, How, and Why?

J. Eric Hillerton, DairyNZ Ltd, Hamilton New Zealand

Session 1 – Management

European Union Bulk Tank SCC Standards and Proposed US Standards: Compliance Based on Data from Four Federal Milk Marketing Orders

Jason E. Lombard¹, H. Duane Norman², Christine A. Koprak¹, Judith M. Rodriguez¹ and Janice R. Wright², ¹U.S. Department of Agriculture–Animal and Plant Health Inspection Service–Veterinary Services, Centers for Epidemiology and Animal Health, Fort Collins, Colorado, USA, ²U.S. Department of Agriculture–Agricultural Research Service, Animal Improvement Programs Laboratory, Beltsville, Maryland, USA

Trends in US Milk Quality Using Bulk Tank Somatic Cell Counts from Four Federal Milk Marketing Orders, 1997-2010

Jason E. Lombard, Christine A. Koprak and Judith M. Rodriguez, U.S. Department of Agriculture–Animal and Plant Health Inspection Service–Veterinary Services, Centers for Epidemiology and Animal Health, Fort Collins, Colorado, USA

Effects of Ultraviolet Light Treatment on Milk Microbiological Quality

James Cullor, Paul Rossitto, Jennifer Crook and Jared Parko, University of California Davis Dairy Food Safety Laboratory, Tulare, California, USA

Preliminary Analysis of Bulk Tank Milk Collected on Organic and Conventional Dairy Herds in Wisconsin

Roxann M. Weix¹, Pamela L. Ruegg¹, Mike J. Gamroth², Ynte H. Schukken³, Kellie M. Cicconi³ and Katie E. Stiglbauer², ¹University of Wisconsin, Madison, Wisconsin, USA, ²Oregon State University, Corvallis, Oregon, USA, ³Cornell University, Ithaca, New York, USA

Evaluation of Novel Practices Addressing Mastitis Control on Organic Dairy Farms in Vermont

John Barlow¹, Matthew Sammons¹, Nick Drolet¹, Sam Hart¹, Brittany Gross² and Amanda Ochoa¹, ¹University of Vermont, Burlington, Vermont, USA, ²University of Pennsylvania, Philadelphia, Pennsylvania, USA

Objective Assessment of Pain in Dairy Cattle with Clinical Mastitis

Colleen E. Fitzpatrick¹, Núria Chapinal^{1,2}, Christina S. Petersson-Wolfe³, Todd F. Duffield¹, David F. Kelton¹, Trevor J. DeVries¹ and Ken E. Leslie¹, ¹University of Guelph, Guelph, Ontario, Canada, ²University of British Columbia, Vancouver, British Columbia, Canada, ³Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA

The Effects of Flunixin Meglumine Treatment on Activity Measures, Feed Intake, and Milk Production During Experimentally Induced Escherichia Coli Mastitis

Emily E. Yeiser¹, Ken E. Leslie² and Christina S. Petersson-Wolfe¹, ¹Virginia Tech University, Blacksburg, Virginia, USA, ²University of Guelph, Department of Population Medicine, Guelph, Ontario

Epidemiology of Mastitis Pathogens in Heifers on a Grazing Dairy

Davin R. Ringen, Douglas Suntrup and John R. Middleton, University of Missouri, College of Veterinary Medicine, Columbia, Missouri, USA

Mining Sensor Data to Discover Clinical Mastitis

Claudia Kamphuis^{1,3}, Herman Mollenhorst¹ and Henk Hogeveen^{1,2}, ¹Utrecht University, Utrecht, The Netherlands, ²Wageningen University, Wageningen, The Netherlands, ³DairyNZ Ltd., Hamilton, New Zealand

Economic Assessment of Using a 3M Petrifilm On-Farm Culture System for Selective Treatment of Clinical Mastitis

Kimberley MacDonald¹, Greg Keefe¹, Jean-Philippe Roy², Ken Leslie³ and Ian Dohoo¹, ¹University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada, ²Université de Montréal, St-Hyacinthe, Quebec, Canada, ³University of Guelph, Guelph, Ontario, Canada

Evaluation of Propane Flaming of Sand for Reducing Bacterial Counts in Bedding

Joseph S. Hogan, Lindsey M. Raubenolt, Janet L. McCormick and William P. Weiss, The Ohio State University, Wooster, Ohio, USA

Evaluation of an Iodine-Based Manuka Honey Teat Dip on Teat End Health

Mark J. Thomas¹ and Daryl V. Nydam², ¹Countryside Veterinary Clinic, LLP, Lowville, New York, USA, ²Cornell University, Ithaca, New York, USA

Session 2 – Diagnostics and Therapy

Accuracy of On-Farm Diagnosis of Clinical Mastitis Using 3M Petrifilm Compared to Standard Microbiology

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Evaluation of Clinical Mastitis Cure Rates Using a 3M Petrifilm On-Farm Culture System

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Test Characteristics of a Petrifilm-Based On-Farm Selective Dry Cow Therapy System – Preliminary Analyses

M. Cameron¹, G.P. Keefe¹, J.P. Roy², and K.A. MacDonald¹, ¹University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada, ²Université de Montréal, Saint Hyacinthe, Québec, Canada

Treatments For Clinical Mastitis and Other Diseases in Large Dairy Herds in Wisconsin

Leane Oliveira and Pamela L. Ruegg, University of Wisconsin, Madison, Wisconsin, USA

Efficacy of 5-Day Intramammary Versus Systemic Benzylpenicillin Treatment of Clinical Mastitis Caused by Gram-positive Bacteria: Evaluation of the Bacteriological Cure Using a PCR Test

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Decision Tree Analysis of Treatment Strategies for Mild and Moderate Cases of Clinical Mastitis Occurring in Early Lactation

Carolina Pinzón-Sánchez, Victor E. Cabrera and Pamela L. Ruegg, University of Wisconsin, Madison, Wisconsin, USA

Measuring Antimicrobial Drug Utilization on Dairy Farms: The Canadian Scenario

Vineet Saini¹, J.T. McClure², David F. Léger³, Simon Dufour⁴, Daniel T. Scholl⁴ and Herman W. Barkema¹, ¹University of Calgary Veterinary Medicine, Calgary, Alberta, Canada, ²Atlantic Veterinary College, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada

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Antimicrobial Resistance Profiles of Bovine Mastitis Pathogens in Canadian Dairy Cattle

Vineet Saini¹, J.T. McClure², David F. Léger³, Greg P. Keefe², Daniel T. Scholl⁴, Doug W. Morck¹ and Herman W. Barkema¹, ¹University of Calgary Veterinary Medicine, Calgary, Alberta, Canada, ²Atlantic Veterinary College, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada, ³Laboratory for Foodborne Zoonoses, Public Health Agency of Canada, Guelph, Ontario, Canada, ⁴University of Montreal, Saint-Hyacinthe, Québec, Canada

Practical Evaluation of Automatic In-Line Mastitis Sensors

Claudia Kamphuis¹, Brian Dela Rue¹, Graeme Mein² and Jenny Jago¹, ¹DairyNZ Ltd., Hamilton, New Zealand

Prevalence of Intramammary Infection at Calving in Cows Selectively Treated at Drying Off Based on On-farm Culture – Preliminary Analyses

M. Cameron¹, G.P. Keefe¹, J.P. Roy² and K.A. MacDonald¹, ¹University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada, ²Université de Montréal, Saint Hyacinthe, Québec, Canada

Efficacy and Economic Benefit of an Internal Teat Sealant During Drought and Rainy Weather Dry Period on Incidence of Clinical Mastitis

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Session 3 – Pathogens

Real Time PCR Values for Mastitis Pathogens – Relations to Milk Quality and Herd Characteristics in Danish Dairy Herds

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Identification of *Mycoplasma* species Using Novel Real-time PCR Assays

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Detection of *Mycoplasma* spp. in Bulk Tank Milk Samples Using Conventional Culture and Real-time PCR

David J. Wilson¹, Anne E. Justice-Allen², Jessie D. Trujillo³ and Greg Goodell⁴, ¹Utah State University, Logan, Utah, USA, ²Arizona Game and Fish Department, Phoenix, Arizona, USA, ³Iowa State University, Ames, Iowa, USA, ⁴The Dairy Authority, Greeley, Colorado, USA

Survey of Bulk Tank Milk From All Danish Dairy Herds in 2009 and 2010 with Real-time PCR

Jorgen Katholm¹ and Torben W. Bennedsgaard², ¹Knowledge Centre for Agriculture, Cattle, Aarhus, Denmark, ²Department of Animal Health and Bioscience, Aarhus University, Foulum, Denmark

Metagenomic Evaluation of Culture-negative Clinical Mastitis Samples for Evidence of a Bacterial Etiology

Joanna Kuehn¹, Patrick Gorden¹, Daniel Munro², Chong Wang¹, Qunfeng Dong², Gregory Phillips¹ and Paul Plummer¹, ¹College of Veterinary Medicine, Iowa State University, Ames Iowa, USA, ²Department of Biological Sciences, University of North Texas, Denton, Texas, USA

***Klebsiella* Mastitis: Prevention and Treatment Recommendations**

Ruth N. Zadoks^{1,2} and Ynte H. Schukken², ¹Moredun Research Institute, Penicuik, Scotland, UK, ²Cornell University, Ithaca, New York, USA

Epidemiologic Aspects of a Mastitis Outbreak Caused by *Prototheca* spp. in a Large Dairy Herd

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Methicillin-resistant *Staphylococcus aureus* (MRSA) in North Carolina Bulk Milk Tanks

Jorge P. Ferreira, Maria T. Correa, Roberta L. Lyman and Kevin L. Anderson, North Carolina State University College of Veterinary Medicine, Raleigh, North Carolina, USA

Effects of *Streptococcus agalactiae* on the Columbian Dairy Industry

Greg Keefe¹, Marcelo Chaffer¹, Alejandro Ceballos², Marcela Londono³, Manuel Jaramillo³ and Mercedes Toro³, ¹University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada, ²Cornell University, Geneseo, New York, USA, and Universidad de Caldas, Manizales, Columbia, ³Colanta, Medellin, Columbia

Experiences from Herd Outbreaks of *Streptococcus agalactiae* Mastitis

Rikard Carlzén¹, Håkan Landin² and Karin Persson Waller^{1,3}, ¹Swedish University of Agricultural Sciences, Uppsala, Sweden, ²Swedish Dairy Association, Stockholm, Sweden, ³National Veterinary Institute, Uppsala, Sweden

Experimentally Induced *Streptococcus uberis* Mastitis in Dairy Heifers: A Challenge Model Incident to a Vaccine Trial

Kayla A. Jackson, Stephen C. Nickerson, Felicia M. Kautz and David J. Hurley, University of Georgia, Athens, Georgia, USA

***Streptococcus uberis* Mastitis Isolates Vary in Their Ability to Form Biofilms**

Maria E. Prado, Glenis E. Moore, Oudessa Kerro-Dego, Raul A. Almeida and Stephen P. Oliver, University of Tennessee, Knoxville, Tennessee, USA

Experimental Mastitis Induced with Two different *Staphylococcus epidermidis* Strains: A Non-invasive Human-originated Strain ATCC 12228 and a Strain from Persistent Bovine Mastitis

Heli Simojoki, Suvi Taponen, Tiina Salomäki, Antti Iivanainen and Satu Pyörälä, ¹University of Helsinki, Helsinki, Finland

Agglutination Tests for Identification of *Staphylococcus aureus* from Cases of Bovine Mastitis

Karin Persson Waller^{1,2}, Susanne André¹, Katarina Järnevi¹ and Helle Ericsson Unnerstad¹, ¹National Veterinary Institute, Uppsala, Sweden, ²Swedish University of Agricultural Sciences, Uppsala, Sweden

Session 4 – Immunology and Host Defense

Establishing Benchmarks to Evaluate and Compare Dairy Herds' Udder Health Status Using Monthly Somatic Cell Counts: Descriptive Data

Véronique Fauteux, Émile Bouchard, Daniel Scholl and Jean-Philippe Roy, Faculty of Veterinary Medicine, University of Montreal, Saint-Hyacinthe, Québec, Canada

Reference System for Somatic Cell Counting in Milk

Silvia Orlandini, Associazione Italiana Allevatori – Laboratorio Standard Latte, Maccarese (Roma), Italy

Association Between Subclinical Hypocalcemia, Milk Somatic Cell Count, and Clinical Mastitis

William G. Chamberlin, John R. Middleton, James N. Spain, Gayle C. Johnson and Mark R. Ellersieck, University of Missouri, Columbia, Missouri, USA

Phenotype Versus Function – Macrophages in the Bovine Teat

Anna Düvel¹, Constanze Frank¹, Hans-Joachim Schuberth¹, Anja Sipka^{1,2}, ¹University of Veterinary Medicine Hannover, Hannover, Germany, ²Cornell University, Ithaca, New York, USA

Mammary Cellular Immune Responses to *Staphylococcus aureus*

Christopher D. Luby¹, Jose Perez-Casal² and Andrew A. Potter², ¹Western College of Veterinary Medicine, Saskatoon, Saskatchewan, Canada, ²Vaccine and Infectious Disease Organization, Saskatoon, Saskatchewan, Canada

Are Cows that Appear Resistant to Natural Infection by *Streptococcus uberis* Resistant to Infection Following a Teat Canal Inoculation?

Sally-Anne Turner, John H. Williamson, S. Jane Lacy-Hulbert and J. Eric Hillerton, DairyNZ Ltd, Hamilton, New Zealand

Immunological Response to an Experimental Intramammary Inoculation with a Killed *Staphylococcus aureus* Strain in Vaccinated and Non-vaccinated Lactating Dairy Cows

Kathelijne Deberdt¹, Sofie Piepers¹, Antoni Prenafeta², Ricard March², Antoni Foix², Roger Guix², Anneleen De Visscher¹, Joren Verbeke¹ and Sarne De Vliegher¹, ¹Ghent University, Merelbeke, Belgium, ²HIPRA, S.A., Girona, Spain

Effect of Pericalving Mastitis in Heifers on First Lactation Yield

Lachlan H. Pearson, John H. Williamson, Sally-Anne Turner, S. Jane Lacy-Hulbert and J. Eric Hillerton, DairyNZ Ltd, Hamilton, New Zealand

Relationship Between Estimated Breeding Value for Somatic Cell Count and Prevalence of Intramammary Infection in Dairy Goats

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Poster Session

Effect of dexamethasone administration on shedding of *Mycoplasma bovis* in calves.

Hussain Alabdullah, Christopher Schneider and Larry Fox, Washington State University, Pullman, Washington, USA

Role of a *Streptococcus uberis* adhesion molecule in adherence to and internalization of *Streptococcus uberis* into bovine mammary epithelial cells.

Raul A. Almeida, Xueyan Chen, Maria E. Prado and Stephen P. Oliver, The University of Tennessee, Knoxville, Tennessee, USA

How common is verotoxin producing *Esherichia coli* in mastitis?

Karin Artursson¹, Anna Aspan¹, Ylva Persson¹ and Robert Söderlund¹, ¹National Veterinary Institute, Uppsala, Sweden

A novel vaccine approach for *Staphylococcus aureus* mastitis using bacteriophage lysis.

John Balcarek¹, Jiri Pillich², Buelon Moss³, Radek Bucek² and Martin Faldyna⁴, ¹Immunology Laboratories, Inc., Birmingham, Alabama, USA, ²Immunology Laboratories, Inc., Brno, Czech Republic, ³Auburn University, Auburn, Alabama, USA, ⁴Veterinary Research Institute, Brno, Czech Republic

The effect of intramammary infection on somatic cell count and milk yield in goats.

Carol Collar¹, Debora Costa Bacon¹, Elizabeth Maga¹, Jim Murray¹, Gerrit Koop² Joan D. Rowe¹ and Jim Cullor¹, ¹University of California, Davis, California, USA, ²Utrecht University, Utrecht, The Netherlands

Neutrophil apoptosis evaluation in milk with high and low somatic cell count.

Rebecca Pessoa, Maiara Blagitz, Camila Batista, Bruna dos Santos, Andréia Parra, Fernando Souza and Alice Della Libera, University of São Paulo, São Paulo, Brazil

Relationship between somatic cell count, somatic cell score, and lactoferrin concentration in milk from high and low somatic cell count cows.

Antonia Domino, Cornell University, Ithaca, New York, USA

Detection of multi drug resistant, enterotoxin producing methicillin resistant *Staphylococcus aureus* in Minnesota bulk tank milk.

Preethi Haran¹, Sandra Godden¹, Jeff Bender¹ and Srinand Sreevatsan^{1, 2}, ¹Veterinary Population Medicine, University of Minnesota, St. Paul, Minnesota, USA, ²Veterinary and Biomedical Sciences, University of Minnesota, St. Paul, Minnesota, USA

Genetic diversity of *Staphylococcus aureus* strains isolated from bovine milk using RAPD-PCR.

Abhijit A. Gurjar, Frank Welcome, Paolo Moroni, Carlos Santisteban and Ynte H. Schukken, Quality Milk Production Services, Cornell University, Ithaca, New York, USA

***In vitro* phenotypic characterization of clinical mastitis-causing *Streptococcus uberis* isolates: Biofilm formation and resistance to phagocytosis.**

Joanna Hintukainen¹, Tiina Salomäki¹, Piret Kalmus², Heli Simojoki¹, Anna-Liisa Myllyniemi³
Satu Pyörälä¹ and Antti Iivanainen¹, ¹University of Helsinki, Helsinki, Finland, ²The Estonian
University of Life Sciences, Tartu, Estonia, ³Finnish Food Safety Authority, Helsinki, Finland

Gene expression of bovine mammary epithelial cells infected with *Escherichia coli* associated with acute or persistent bovine mastitis.

Oudessa Kerro Dego, Raul A. Almeida and Stephen P. Oliver, The University of Tennessee,
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Identification of virulence-associated genes and their expression patterns in strains of *Escherichia coli* associated with bovine mastitis.

Oudessa Kerro Dego, Raul A. Almeida and Stephen P. Oliver, The University of Tennessee,
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Nordic guidelines for mastitis therapy.

Håkan Landin¹, Jonas Carlsson¹, Knut-Ove Hennum², Jorgen Katholm³, Laura Kulkas⁴, Ylva
Persson¹, Kerstin Plym-Forshell², Erik Rattenborg³, Charlotte Sandgren¹, Liv Solverod², Anne
Cathrine Whist², ¹Swedish Dairy Association, Stockholm, Sweden, ²Tine Dairy Industries, As,
Norway, ³Knowledge Center for Agriculture, Aarhus, Denmark, ⁴Valio R&D, Tampere, Finland

Influence of bacterial genotype on outcome of clinical *Staphylococcus aureus* mastitis.

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Institute, Uppsala, Sweden, ²Swedish University of Agricultural Sciences, Uppsala, Sweden

Drying-off practices on Ohio dairies.

Päivi J. Rajala-Schultz and Luciana da Costa, The Ohio State University, Columbus, Ohio, USA

Etiology of bovine mastitis on dairy farms in Northern Antioquia, Colombia.

Nicolás Ramírez¹, Ofelia Arroyave¹, Mario Cerón², Manuel Jaramillo³, Juan M. Ceron³ and
Guillermo Palacio¹, ¹Grupo Centauro, Universidad de Antioquia, Medellín, Colombia, ²Grupo
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Raw milk quality on Wisconsin farmstead dairies.

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USA

Identification of genes differentially present in strains of *Klebsiella pneumoniae* associated with bovine clinical mastitis.

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Evaluation of matrix-assisted laser desorption ionization time-of-flight mass spectrometry to identify the causative agents of mastitis without microbiological culture.

Juliana Barreiro¹, Christina Ferreira², Gustavo Sanvido², Juliano Gonçalves¹, Marcos Eberlin² and Marcos Santos¹, ¹University of São Paulo, Pirassununga, Brazil, ²State University of Campinas, Campinas, Brazil

Use of cotton-swabs in detection of *Staphylococcus aureus* in bovine milk.

Amanda N. Wagner, Päivi J. Rajala-Schultz, Luciana Casimiro da Costa, College of Veterinary Medicine, The Ohio State University, Columbus, Ohio, USA

***Lactococcus lactis* subsp. *lactis* and intramammary infection on three New York dairy farms.**

Arfan Yousaf, Brenda Werner, Francis Welcome, Lucia Alconero, Ynte Schukken and Paolo Moroni, Quality Milk Production Services, Cornell University, Ithaca, New York, USA

Naturally occurring chronic mastitis has negative effects on ovarian functions.

Mahbubur Rahman¹, Maria Mazilli², Georgia Pennarossa¹, Tiziana A.L. Brevini¹, Arianna Vanelli¹, Alfonso Zecconi² and Fulvio Gandofi¹, ¹DSA, ²DIPAV, Università Degli Studi di Milano, Milan, Italy

Influence of dry period length on somatic cell count after calving.

Lucio Zanini¹ and Alfonso Zecconi², ¹SATA Lombardia, Italy ²DIPAV, Università Degli Studi di Milano, Milan, Italy

This proceedings includes papers presented at the Third International Symposium on Mastitis and Milk Quality, sponsored by the National Mastitis Council (NMC) and the American Association of Bovine Practitioners (AABP). These papers report research results and/or opinions of the authors. Publication of this information does not imply endorsement of the contents by the NMC or the AABP. Papers may be reproduced for educational purposes provided credit is given to the author(s) and sponsoring organizations.