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T56 Study of the genetic diversity of *Geotrichum candidum*. I. Alper* and S. Labrie, *Département des sciences des aliments et de nutrition, Centre de recherche en sciences et technologie du lait (STELA) – Institut des nutraceutiques et des aliments fonctionnels (INAF), Université Laval, Quebec, QC, Canada*.

Geotrichum candidum is a dimorphic yeast commonly inoculated on surface-ripened cheeses. The technological properties of *G. candidum* are strain-dependent, so analytical tools are vital for differentiating strains. The aim of the present study was to determine the genetic diversity of 16 *G. candidum* strains isolated from various environmental niches using ribotyping and random amplification of microsatellites by PCR (RAM-PCR). Ribotyping involves the sequencing of the operon coding for rDNA, especially the internal transcribed spacer regions, ITS1 and ITS2. We report, for the first time, the sequence of the rDNA operon of *G. candidum*. All the *G. candidum* strains were closely related phylogenetically and could be classified as members of de Hoog and Smith′s Group 1. While the strains could not be differentiated based solely on the sequence of the ITS1-5.8S-ITS2 region, seven could be differentiated by polymorphism analysis of the entire operon. Four RAM-PCR primers were tested, but only (GATA)4 resulted in PCR patterns that differentiated five strains. When combined, the two techniques made it possible to differentiate 10 of the 16 strains. These findings suggest that multilocus sequence typing, which is commonly used to differentiate strains of *Candida albicans*, a pathogenic yeast phylogenetically closer to *G. candidum*, may be an alternative method for studying the genetic diversity of *G. candidum* strains.

Key Words: *Geotrichum candidum*, rDNA operon, ribotyping

T57 Effect of somatic cell count on milk composition. R. Noorbakhsh*[1], A. Mortazavi[1], F. Shahidi[1], A. F. Mehdikhani[2], M. Ahoei[2], and A. Heravi Moussavi[2], [1]*Dept of Food Science and Technology, Ferdowsi University of Mashhad, Mashhad, Khorasan, Iran*, [2]*Dept of Animal Science, Ferdowsi University of Mashhad, Mashhad, Khorasan, Iran*.

The study was designed to evaluate the effect of somatic cell count (SCC) on milk composition. In total, 127 dairy farms bulk milk were used during 2007 and 2008. The farms located in east northern of Iran. Somatic cell count and milk composition were measured in the bulk milk. The SCC data was divided into five categories based on the California Mastitis Test (CMT) scores and these categories, rather than the continuous variable from which they were derived, were used for studying the effect of SCC on milk composition. The range of leukocyte levels in different CMT scores were: N, 0-200000; T, 200000-400000; 1, 400000-1200000; 2, 1200000-5000000; and 3, >5000000 per ml. Due to low number of records for the last score the data were excluded before further analysis. The model for analyzing the effect of CMT scores on milk composition also included year and season. The data were analyzed using General Linear Models. The SCC averaged 590730 ± 12353 leukocytes per ml. The median was 454000 cells and 25 and 75% quartiles were 322000 and 713000 leukocytes per ml, respectively. The distribution analysis showed that 44.3% of the data were between 250000 and 499000 leukocytes per ml. The SCC was numerically reduced in year 2008 compare with 2007 which shows an improvement in milk quality ($p=0.23$; 616614±60316 and 575043±54308 cells/ml, respectively for 2007 and 2008). The effect of season was significant and SCC was greatest in winter compare with summer and autumn ($p<0.01$). Milk fat ($p<0.01$; 3.46, 3.54, 3.56, and 3.63 ± 0.04%, respectively for N, T, 1, and 2) and protein ($p=0.04$; 3.08, 3.06, 3.05, and 3.07 ± 0.01%, respectively for N, T, 1, and 2) contents were affected by the CMT score groups. The effect of season was significant ($p<0.01$). Milk lactose and solids-not-fat contents were similar among the groups. The results demonstrated that milk fat and protein contents were affected by SCC. Results also presented a trend in milk quality improvement over the years.

Key Words: dairy cows, somatic cell count, milk composition

T58 Impact of *Lactobacillus acidophilus* NCFM surface protein expression on its binding properties toward the milk fat globule membrane. G. Brisson, H. F. Payken, E. Pettey, and R. Jimenez-Flores*, *California Polytechnic State University, San Luis Obispo*.

Dairy products are commonly used as a delivery system for the probiotic lactic acid bacteria (LAB). Recent genomics studies have revealed the importance of the milk environment in the expression of LAB probiotic functions. However, to date little is know on how the dairy products positively affect these probiotic bacteria function. The milk fat globule membrane (MFGM) contains components that are known to bind to LAB cell surface such as glycoproteins (mucins) and phospholipids. On the counterpart, proteins expressed at the surface of the lactic acid bacteria could also affect the bacterial adhesion to MFGM. This work aims to elucidate the impact *Lactobacillus acidophilus* NCFM cell surface protein on its ability to bind to the MFGM. Five mutant strains with single gene deletion on genes encoding for different surface proteins were obtained from Dr. T. Klaenhammer's laboratory (NC State University). The binding properties of these *L. acidophilus* NCFM mutant strains were tested toward the MFGM components present in buttermilk powder. The binding frequency of the different strains was determined by means of a sucrose density gradient procedure coupled to bacterial DNA quantification. The bacteria cell surface was characterized by determining their surface hydrophobicity and their surface protein profile after 5 M LiCl treatment. The results showed that the binding ability of the different strains was influenced by the bacterial surface hydrophobicity and their surface protein profile. The wild type NCFM and 4 of the mutants showed similar binding patterns, and under statistical scrutiny low significant difference. However, the deletion mutant to the S-layer protein slpA, showed a remarkable different binding pattern. This mutant bound tightly (average of 98% of cells in the assay) to buttermilk components. Verification of the differences in binding patterns were made by confocal fluorescent microscopy. Further work will focus on identifying the binding elements in the bacteria and the MFGM.

Key Words: lactobacillus, MFGM, probiotic

T59 Acid tolerance of *Lactobacillus acidophilus* LA-K as influenced by various pulsed electric field conditions. O. Cueva[1] and K. Aryana*[2,1], [1]*Louisiana State University, Baton Rouge*, [2]*Louisiana State University Agricultural Center, Baton Rouge*.

Pulsed electric field (PEF) processing involves the application of pulses of voltage for less than one second to fluid foods placed between two electrodes. *Lactobacillus acidophilus* is an important probiotic bacterium used for the production of fermented dairy products. Objective of this study was to elucidate the influence of certain PEF conditions on the acid tolerance of *Lactobacillus acidophilus* LA-K. Freshly thawed *Lactobacillus acidophilus* LA-K was suspended in sterile peptone 0.1% w/v distilled water and treated in a pilot plant PEF system. The treatments were pulse width (3, 6 and 9 µs), pulse period (10,000; 20,000 and 30,000 µs) and voltage (5, 15 and 25 kV/cm). Control was run through PEF system at 60 mL/min without receiving any pulsed electric field condition. Acid tolerance was determined at 0, 5, 10 and

Tuesday, July 14

POSTER PRESENTATIONS

Animal Health
Mastitis and Associated Microbiology

T1 Natural autoantibodies in milk and their role in the development of mastitis in dairy cows. A. T. M. Van Knegsel*, G. De Vries Reilingh, A. Lammers, B. Kemp, and H. K. Parmentier, *Adaptation Physiology Group, Wageningen Institute of Animal Sciences, Wageningen University*, *Wageningen, the Netherlands*.

T2 Psoriasin expression in bovine udder is induced by *E. coli* infection. P. Regenhard*[1], W. Petzl[2], H. Zerbe[2], and H. Sauerwein[1], [1]*Institute of Animal Science*, *Bonn, NRW, Germany*, [2]*Clinic for Ruminants*, *Munich, Bavaria, Germany*.

T3 Innate immune responses in dairy cows and study of a promising candidate: Osteopontin. K. Alain[1,3], N. A. Karrow[3], C. Thibault[1], M. Lessard[1], and N. Bissonnette*[1,3], [1]*Dairy and Swine Research and Development Center, Agriculture and Agri-Food Canada*, *Sherbrooke, Québec, Canada*, [2]*Université de Sherbrooke*, *Sherbrooke, Québec, Canada*, [3]*University of Guelph*, *Guelph, Ontario, Canada*.

T4 Expression of Toll like receptor 4 on bovine neutrophils is not dependent on transcriptional activation. M. Worku*, A. Morris, H. Mukthar, and N. Mikiashvilli, *North Carolina A&T State University*, Greensboro.

T5 Comparison of in vivo and in vitro mammary cell expression of selected inflammatory genes in response to α-linolenic acid. P. Rezamand*, B. P. Hatch, K. Parnell, K. M. Hunt, J. E. Williams, W. Price, and M. A. McGuire, *University of Idaho*, *Moscow*.

T6 Development of a multiplex-PCR detection assay for simultaneous identification of the major pathogens causing mastitis in dairy milk. B. Cressier*[1,2], C. Thibault[1], and N. Bissonnette[1,2], [1]*Dairy and Swine Research and Development Center, Agriculture and Agri-Food Canada*, *Sherbrooke, Québec, Canada*, [2]*Université de Sherbrooke*, *Sherbrooke, Québec, Canada*.

T7 Microbiology results of milk samples from California dairies received between 1999 and 2008. D. F. Resende*, K. Glenn, J. S. Cullor, and R. G. S. Bruno, *University of California-Davis*, *Tulare*.

T8 Prototheca mastitis outbreak investigation in lactating Jersey cows. A. G. Kenyon*, D. F. Resende, K. Glenn, R. Moeller, and R. G. S. Bruno, *University of California-Davis*, *Tulare*.

T9 Comparison of 16S rRNA gene sequence analysis with aerobic milk culture for the identification of potential bacterial etiologies of bovine clinical mastitis. J. R. Wenz*, T. E. Besser, L. K. Fox, and Y. Zhang, *Washington State University*, *Pullman*.

T10 Effect of year period on mastitis prevalence and routine procedures characteristics of milking in Culiacán, Sinaloa. M. Valdez*, M. A. Luque, L. Almeida, J. Rodríguez, F. T. Olivas, and D. C. Ochoa, *Investigación y Transferencia de Tecnología para Rumiantes, Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma de Sinaloa*, *Culiacán, Sinaloa, México*.

T11 Effects of *Mangifera indica* peel extracts on *Staphylococcus aureus* mammary infections. S. Stella and D. Tedesco*, *University of Milan, VSA Dep.*, *Milan, Italy*.

T12 Effects of OmniGen-AF on mammary mucosal responses to an *Escherichia coli* challenge. Y.-Q. Wang*, A. Rowson, N. E. Forsberg, and S. B. Puntenney, *OmniGen Research*, *Corvallis, OR*.

T13 Decision-making for early postpartum subclinical mastitis. V. E. Cabrera*, J. Pantoja, P. Ruegg, and G. Shook, *University of Wisconsin*, *Madison*.

T14 Effects of CpG ODN adjuvant on the immune responses elicited by a quadrovalent mastitis vaccine in dairy cows. S.-C. Lee[1] and J.-W. Lee*[2], [1]*Graduate Institute of Animal Vaccine Technology, National Pingtung University of Science and Technology*, *Neipu, Pingtung, Taiwan*, [2]*Department of Tropical Agriculture and International Cooperation, National Pingtung University of Science and Technology*, *Neipu, Pingtung, Taiwan*.

T15 Intramammary glucocorticoid treatment during LPS-induced mastitis. O. Wellnitz, M. Saudenowa, and R. M. Bruckmaier*, *University of Bern, Vetsuisse Faculty, Veterinary Physiology*, *Bern, Switzerland*.

T51 Effect of carbon dioxide on microbial growth in refrigerated raw milk. P. C. B. Vianna and M. L. Gigante*, *State University of Campinas*, *Campinas, SP, Brazil*.

T52 Expression profile analysis of intestinal cells effected by *Lactobacillus acidophilus* NCFM. M. Wang[1], G. Zhang[1], L. Yao[1], Y. Zhou[1], L. Han[1], and Y. Jiang*[1,2], [1]*Key Lab of Dairy Science, Ministry of Education, Northeast Agricultural University*, *Harbin, China*, [2]*National Dairy Engineering & Technical Research Center, Northeast Agricultural University*, *Harbin, China*.

T53 Development of a Multiplex-PCR detection assay for simultaneous identification of the major mastitis causing pathogens in dairy milk. B. Cressier*[1], C. Thibault[2], and N. Bissonnette[1,2], [1]*Université de Sherbrooke*, *Sherbrooke, QC, Canada*, [2]*Agriculture and Agri-Food Canada*, *Sherbrooke, QC, Canada*.

T54 Nisin-inducible expression of recombinant peptides in dairy lactic acid bacteria. J. A. Renye and G. A. Somkuti*, *USDA-Agricultural Research Service*, *Wyndmoor, PA*.

T55 Growth-promoting activities of bovine and caprine caseinomacropeptide. G. Robitaille*, R. Ioannoni, and C. Jolicoeur, *Food Research and Development Centre, Agriculture and Agri-Food Canada*, *St-Hyacinthe, QC, Canada*.

T56 Study of the genetic diversity of *Geotrichum candidum*. I. Alper* and S. Labrie, *Département des sciences des aliments et de nutrition, Centre de recherche en sciences et technologie du lait (STELA) – Institut des nutraceutiques et des aliments fonctionnels (INAF), Université Laval*, *Quebec, QC, Canada*.

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T59 Acid tolerance of *Lactobacillus acidophilus* LA-K as influenced by various pulsed electric field conditions. O. Cueva[1] and K. Aryana*[2,1], [1]*Louisiana State University*, *Baton Rouge*, [2]*Louisiana State University Agricultural Center*, *Baton Rouge*.

T60 Growth of *Lactobacillus acidophilus* LA-K as influenced by certain pulsed electric field conditions. O. Cueva[1] and K. Aryana*[2,1], [1]*Louisiana State University*, *Baton Rouge*, [2]*Louisiana State University Agricultural Center*, *Baton Rouge*.

T61 Stability of *Bifidobacterium animalis* ssp. *lactis* BB12 in yogurt smoothie developed for use in clinical trials with children. E. Furumoto, L. Weir*, and R. Roberts, *Department of Food Science, The Pennsylvania State University*, *University Park*.

T62 Bile tolerance of *Lactobacillus acidophilus* LA-K as influenced by certain pulsed electric field conditions. O. Cueva[1] and K. Aryana*[2,1], [1]*Louisiana State University*, *Baton Rouge*, [2]*Louisiana State University Agricultural Center*, *Baton Rouge*.

T63 European Union Decision 2073/2005: A comparison between 3M Petrifilm *Enterobacteriaceae* and ISO 21528:2 in a milk powder production chain. M. Ferraz*, M. Cerqueira, and M. Souza, *Universidade Federal de Minas Gerais*, *Belo Horizonte, Minas Gerais, Brasil*.

T64 Environmental scanning of bacteria with the potential to produce ropy milk in a farm. A. Laubscher*[1], K. White[1], A. Cano[1], R. Cano[2], and R. Jimenez-Flores[1], [1]*Dairy Products Technology Center, California Polytechnic State University*, *San Luis Obispo*, [2]*Biological Sciences Department, California Polytechnic State University*, *San Luis Obispo*.

T65 Influence of growth medium composition on survival and storage stability and viability of lactobacilli during freeze-drying. M. I. Tudor, E. P. Cuesta-Alonso*, and S. E. Gilliland, *Oklahoma State University*, *Stillwater*.

T66 Development of a sequence-based molecular subtyping method for *Bacillus cereus* dairy isolates. D. Miller*, S. Doores, and R. Roberts, *Pennsylvania State University*, *University Park*.

T67 Confirmation of *Bacillus cereus* milk isolates using traditional microbiological and a recently developed molecular method. D. Miller*, S. Doores, and R. Roberts, *Pennsylvania State University*, *University Park*.

T68 Influence of the sample pre-heating and time for reanalysis in the Total Bacteria Count of milk by flow cytometry. L. Clementino[1,2], F. A. Pinto[1,2], L. M. Fonseca[1,2], J. F. Castro[1], R. Rodrigues[1,2], M. M. O. P. Cerqueira*[1,2], M. O. Leite[1,2], C. S. P. Fonseca[1], C. F. A. M. Penna[1,2], and M. R. Souza[1,2], [1]*Federal University of Minas Gerais (UFMG), School of Veterinary Medicine, Department of Food Technology and Inspection*, *Belo Horizonte, MG, Brazil*, [2]*Laboratory of Milk Quality Analysis*, *Belo Horizonte, MG, Brazil*.

T69 Methodology for differentiation of lactic acid bacteria in cheese made with probiotic adjunct cultures. C. J. Oberg*[1], L. Moyes[1], C. Brothersen[2], and D. J. McMahon[2], [1]*Microbiology Department, Weber State University*, *Ogden, UT*, [2]*Western Dairy Center, Utah State University*, *Logan*.

T70 Use of supercritical fluid extraction to remove non-polar lipids from whey buttermilk powder. M. R. Costa*[1,2], M. L. Gigante[2], and R. Jiménez-Flores[3], [1]*Universidade Norte do Paraná*, *Londrina, Paraná, Brazil*, [2]*Universidade Estadual de Campinas*, *Campinas, São Paulo, Brazil*, [3]*California Polytechnic State University*, *San Luis Obispo*.