INTERPRETIVE SUMMARIES, FEBRUARY 2014

Risk-based audit selection of dairy farms. *By van Asseldonk and Velthuis, page 592.* To select higher-risk farms for an audit, we tested the relation between the outcome of farm audits and bulk milk quality tests before the audit. The analysis comprised 28,358 farm audits and all conducted quality tests of bulk milk samples 12 months before the audit. Milk quality information can be used to select higher-risk farms to be audited more frequently. In order to capture 25, 50, and 75% of the farm population with poor process standards (i.e., rejected), only 8, 20, and 47% of the population, respectively, had to be sampled based on a risk-based selection approach.
http://dx.doi.org/10.3168/jds.2013-6604.

Assessing the yield, microstructure, and texture properties of miniature Chihuahua-type cheese manufactured with a phospholipase A_1 and exopolysaccharide-producing bacteria. *By Trancoso-Reyes et al., page 598.* Cheese yield is a crucial determinant of profitability in cheese manufacturing plants; therefore, different methods have been developed to increase yield. In this work, we used an enzyme that modifies milk fat combined with a bacterial culture that produces gums as a means to improve the yield of Chihuahua cheese. Incorporation of the enzyme together with the use of the bacterial culture increased the yield in the manufacture of Chihuahua cheese from 9.21 to 10.81 kg of cheese/100 kg of milk, without changing the perception of texture or flavor.
http://dx.doi.org/10.3168/jds.2013-6624.

Identification of a microscopically selected microorganism in milk samples. *By Bracke et al., page 609.* Identification of microscopically observed microbial contaminants in food products is hindered by several challenges, including (1) the low quantity of contaminating organisms in a complex matrix with abundant other organisms, and (2) the difficulty of culturing the contaminating microorganism due to changes in its morphology (e.g., spores). Consequently, it is very difficult to obtain sufficient quantities of these contaminating microorganisms, allowing identification only by biochemical assays or profiling methods. We developed a selective identification method based on laser capture microdissection and succesfully applied our method in dairy samples.
http://dx.doi.org/10.3168/jds.2013-6932.

Oxidative stability of yogurt with added lutein dye. *By Domingos et al., page 616.* Exposure of yogurts to light in supermarkets favors oxidation due to the presence of riboflavin. This compound is capable of absorbing light, unleashing reactions responsible for off-flavor formation and the loss of nutrients. The addition of lutein to yogurts could prevent the photooxidative damage by acting as a light filter and scavenging reactive species. In addition, lutein has been associated with the reduction and prevention of age-related macular degeneration. The objective of the present work was to evaluate the influence of adding lutein dye on the oxidative stability of yogurt.
http://dx.doi.org/10.3168/jds.2013-6971.

Volatile organic compounds profile during milk fermentation by *Lactobacillus pentosus* and correlations between volatile flavor and carbohydrate metabolism. *By Pan et al., page 624.* The naturalness and agreeable taste of yogurt make it an attractive food for consumption. Flavor, as one of the most important taste properties determining the acceptability and preference of fermented milks, is influenced by compositional and processing factors. We explored the metabolism of lactose and xylose by *Lactobacillus pentosus* and found that xylose metabolized by *Lb. pentosus* strongly affects the flavor of yogurt. Production of volatile flavor components, such as 2,3-butanedione and acetic acid, is important in yogurt production. Xylose metabolized by *Lb. pentosus* has potential value in the dairy industry, particularly in the consumer acceptability of fermented milk products.
http://dx.doi.org/10.3168/jds.2013-7131.

Thermal inactivation kinetics of Shiga toxin-producing *Escherichia coli* in buffalo Mozzarella curd. *By Trevisani et al., page 642.* Use of raw milk is allowed in the production of Mozzarella di bufala Campana because the curd is spun and stretched in hot water at 85 to 90°C, thus reaching temperatures between 65°C and 80°C. Shiga toxin-producing *Escherichia coli* (STEC) may be present on buffalo dairy farms and in raw milk, so challenge tests are useful to predict the rate of inactivation of STEC during heat treatments. A 4-log reduction of STEC (serogroups O26 or O157) was achieved when curd was heated at 68°C for 2.6 to 6.3 min or at 80°C for 2.1 to 2.3 min. Thermal inactivation models were developed to provide quantitative estimations of the microbial reduction to be further used for risk assessment.
http://dx.doi.org/10.3168/jds.2013-7150.

Oral administration of bovine lactoferrin attenuates ultraviolet B-induced skin photodamage in hairless mice. *By Murata et al., page 651.* Lactoferrin is recognized as a host defensive glycoprotein, especially for newborn infants; however, the effects of lactoferrin on ultraviolet (UV)-induced skin photodamage have not been elucidated. In this report, we describe for the first time that oral supplementation with lactoferrin has a protective effect against UV-induced skin aging, includ-

ing morphological changes and skin-barrier damage, in hairless mice. Our findings suggest that oral supplementation with lactoferrin exerts an antiinflammatory activity by inhibition of UV-stimulated interleukin-1β production and prevents epidermal barrier dysfunction. http://dx.doi.org/10.3168/jds.2013-7153.

Effect of moderate inlet temperatures in ultra-high-pressure homogenization treatments on physicochemical and sensory characteristics of milk. *By Amador-Espejo et al., page 659.* Cooked off-flavor in ultra-high-temperature (UHT) milk is the greatest disadvantage of this treatment. Ultra-high-pressure homogenization (UHPH) is a novel process to treat milk that can achieve the same degree of microbial inactivation as heat treatment, but with fewer changes in sensory and physicochemical characteristics. The objective of this project was to evaluate the effect of UHPH at moderate temperatures on the physicochemical and sensory characteristics of milk. Sterility in UHPH milk can be obtained, with a less intense cooked off-flavor and similar or better physicochemical characteristics compared with UHT milk.
http://dx.doi.org/10.3168/jds.2013-7245.

Antiproliferative activity of tea catechins associated with casein micelles, using HT29 colon cancer cells. *By Haratifar et al., page 672.* Tea polyphenols have been reported to exhibit several beneficial health effects. However, to exert their benefits in vivo, polyphenols must be available and active. We hypothesized that due to the binding of milk proteins with epigallocatechin gallate (EGCG), milk could encapsulate and deliver this bioactive molecule. Nanoencapsulated EGCG was able to decrease the proliferation of HT-29 cancer cells, demonstrating that bioavailability may not be reduced by EGCG–protein interactions. Therefore, milk is an ideal platform for delivery of bioactive compounds to obtain a new generation of dairy products that provide additional benefits to human health.
http://dx.doi.org/10.3168/jds.2013-7263.

Effect of colostrum on gravity separation of milk somatic cells in skim milk. *By Geer and Barbano, page 687.* We determined that milk somatic cells (SC) separate due to gravity in raw and minimally pasteurized raw milk, but at higher pasteurization temperatures, subsequent gravity separation of SC does not occur . Addition of colostrum (a good source of immunoglobulins) restored the gravity separation of SC in skim milk that was heated to high temperature. Immunoglobulins may also play a role in the gravity separation of bacteria and spores in skim milk.
http://dx.doi.org/10.3168/jds.2013-7360.

Production of galactooligosaccharides using a hyperthermophilic β-galactosidase in permeabilized whole cells of *Lactococcus lactis*. *By Yu and O'Sullivan, page 694.* Galactooligosaccharides (GOS) can be produced from lactose by β-galactosidase, but the process is more efficient at high temperatures. A synthetic gene (*lacSt*) encoding a hyperthermophilic β-galactosidase was constructed and introduced into *Lactococcus lactis*, which enabled production of *Lc. lactis* cells containing high levels of this enzyme. Following permeabilization of these whole cells with ethanol, more than 197 g/L of GOS was obtained from 40% initial lactose. However, the highest conversion rate was found for a 5% lactose solution, suggesting future application for the production of highly GOS-enriched foods from whey-based substrates using this cost-effective method.
http://dx.doi.org/10.3168/jds.2013-7492.

Short communication: **Genetic characterization of antimicrobial resistance in *Acinetobacter* isolates recovered from bulk tank milk.** *By Tamang et al., page 704.* The nonfermenting bacteria *Acinetobacter* have been previously reported as one of the agents of bovine mastitis. In this study, we investigated the genetic basis of antimicrobial resistance in *Acinetobacter* isolates recovered from bulk tank milk samples in Korea. Understanding the resistance mechanism associated with the resistance phenotype and the genes involved in resistance may help in the development of strategies to control infections such as mastitis and to prevent further dissemination of antibiotic resistance genes. To the best of our knowledge, this is the first report of molecular characterization of antimicrobial-resistant *Acinetobacter* spp. from milk.
http://dx.doi.org/10.3168/jds.2013-7403.

Technical note: **The equivalency of sodium results in cheese digested by either dry ashing or microwave-accelerated digestion.** *By Schoenfuss et al., page 710.* Traditional sample preparation of cheese before mineral analysis by atomic absorption spectroscopy requires wet ashing with nitric acid or dry ashing, both of which can be time consuming and hazardous. A microwave-accelerated reaction system allows for rapid and automatic wet acid digestions of multiple samples in less than 1 h. Samples of blue cheese (138, in duplicate) were prepared for atomic absorption spectroscopy by both dry ashing and microwave-accelerated digestion, and the sodium values obtained were compared. The microwave method was found to produce results equivalent to those achieved by the dry-ashing procedure.
http://dx.doi.org/10.3168/jds.2013-7420.

Exploring the value of routinely collected herd data for estimating dairy cattle welfare. *By de Vries et al., page 715.* Routine on-farm assessment of dairy cattle welfare is time consuming and, therefore, expensive. Our aim was to explore the value of routine