Effect of cell-surface components and metabolites of lactic acid bacteria and probiotic organisms on cytokine production and induction of CD25 expression in human peripheral mononuclear cells. By Ashraf et al., page 2542. The immuno-modulatory role of cell-surface components and metabolites of 17 strains of probiotic and lactic acid bacteria were compared. From the different immune factors tested, proinflammatory immune responses were mainly directed through cell-surface structures but antiinflammatory immune responses were mediated by both metabolites and cell-surface structures of these bacteria. Moreover, regulatory T-cell activity was principally triggered by cell-surface structures, indicating that bacterial components differed in their immune effects. Bacterial strains demonstrating high induction of regulatory T-cell count could be helpful in maintaining self-tolerance and in the treatment of autoimmune diseases.


In vitro iron absorption of α-lactalbumin hydrolysate-iron and β-lactoglobulin hydrolysate-iron complexes. By Wang et al., page 2559. Iron deficiency leads to iron deficiency anemia (IDA), which is the most common and widespread nutritional disorder. β-Lactoglobulin hydrolysate (β-LGH) and α-lactalbumin hydrolysate (α-LAH) can bind with iron and form complexes, which may have potential to promote iron absorption.

http://dx.doi.org/10.3168/jds.2013-7461.

Lactose and galactose content in cheese results in overestimation of moisture by vacuum oven and microwave methods. By Lee et al., page 2567. Moisture analysis in cheese serves many purposes affecting regulatory, economic, and functional concerns. Even small deviations in moisture testing accuracy can have significant effects. The presence of the residual sugars lactose and galactose resulted in overestimation of moisture content when cheese was analyzed by vacuum oven and microwave methods. This overestimation depended on cheese type, sugar concentration, sugar type, and testing method. The overestimation appeared to result from the creation and volatilization of compounds from browning reaction pathways.

http://dx.doi.org/10.3168/jds.2013-7522.

Probiotic viability and storage stability of yogurts and fermented milks prepared with several mixtures of lactic acid bacteria. By Mani-López et al., page 2578. This study reports differences and similarities in probiotic yogurts and fermented milks prepared with several mixtures of lactic acid bacteria during fermentation and 35 d of cold storage. Three probiotic Lactobacillus species (L. acidophilus, L. casei, and L. rhamnosus) were evaluated in combination with Lactobacillus delbrueckii ssp. bulgaricus, Streptococcus thermophilus, or both. Firmness, syneresis, color, and sensory attributes were similar for probiotic yogurts and fermented milks. The viability of probiotic bacteria was different in yogurts and similar between fermented milks.

http://dx.doi.org/10.3168/jds.2013-7551.

Development of a locally sustainable functional food based on mutandabota, a traditional food in southern Africa. By Mpofu et al., page 2591. A probiotic dairy product was developed based on a traditional dish called mutandabota to enable resource-poor populations in southern Africa to benefit from a functional food. Mutandabota is made from milk, baobab fruit pulp, and sugar. Probiotic mutandabota contained 8.8 ± 0.4 log cfu/mL viable cells of Lactobacillus rhamnosus yoba at the time of consumption. The pH of probiotic mutandabota was 3.5, which ensured its microbiological safety. This technology could be applied to other traditional foods, thus enhancing access to probiotics in communities that need them most.

http://dx.doi.org/10.3168/jds.2013-7593.

Changes in expected taste perception of probiotic and conventional yogurt made from goat milk after rapidly repeated exposure. By Costa et al., page 2610. Goat milk is a food with high biological value. However, it has a high concentration of short-chain fatty acids, such as caprylic, capric, and caproic acids, which negatively influence acceptance of its derivatives for certain consumers. Rapidly repeated exposure was used in this study as a different sensory strategy, which was sufficient to significantly increase the familiarity. However, it was not enough to significantly increase acceptance for goat milk yogurt in these consumers.

http://dx.doi.org/10.3168/jds.2013-7617.

The effect of linear velocity and flux on performance of ceramic graded permeability membranes when processing skim milk at 50°C. By Zuleska and Barbano, page 2619. Microfiltration of skim milk using ceramic uniform transmembrane pressure (UTP) and graded permeability (GP) membranes resulted in similar final retentates in terms of serum protein (SP) removed. The SP removal rate (expressed as kg of SP removed per m² of membrane area) was higher for GP membranes than for UTP membranes for each stage, which could improve the economics of microfiltration.


Correlation between standard plate count and somatic cell count milk quality results for Wis-
cousin dairy producers. By Borneman and Ingham, page 2646. This study found a very strong correlation between Wisconsin producer monthly standard plate count (SPC) and somatic cell count (SCC) results in 2012. Dairy producers practicing good sanitation and milk-temperature control (leading to low SPC) are also likely to practice good herd health management (leading to low SCC). However, many other factors, besides SCC, influence SPC.


Bovine κ-casein inhibits human rotavirus (HRV) infection via direct binding of glycans to HRV. By Inagaki et al., page 2653. Bovine κ-caseins in late colostrum obtained from nonimmunized cows on d 6 to 7 after parturition, as well as in mature milk, were shown to directly bind to human rotavirus, and thereby inhibit viral adsorption onto cells. Although α-linked glycans found in late colostrum and mature milk differ, both types bound to the virus, and heat treatment of κ-caseins weakened their viral inhibitory activity, suggesting that heat-labile structures have a role in viral binding.

http://dx.doi.org/10.3168/jds.2013-7792.

Short communication: Is consumption of a cheese rich in angiotensin-converting enzyme-inhibiting peptides, such as the Norwegian cheese Gamalost, associated with reduced blood pressure? By Nilsen et al., page 2662. Cheese and dairy products are good sources of bioactive peptides, which may have a positive effect on human health. Among those, the angiotensin-converting enzyme (ACE)-inhibiting peptides have the potential to lower blood pressure. This cross-sectional study, focusing on the intake of the traditional Norwegian cheese Gamalost, indicated an association of cheese consumption and lower blood pressure of a population.


The relationship between compost bedded pack performance, management, and bacterial counts. By Black et al., page 2669. A field survey of 42 routinely aerated compost bedded pack barns was conducted in Kentucky between October 2010 and March 2011. Mastitis-causing bacteria thrive in conditions similar to that of composting bacteria and microbes, making elimination of these at higher temperatures (55 to 65°C) difficult in an active composting environment. Producers must use recommended milking procedures and other preventative practices to maintain low somatic cell count in herds with a compost bedded pack barn, as the composting process does not adequately sanitize the bedding material.

http://dx.doi.org/10.3168/jds.2013-6779.

Identification of predictive biomarkers of disease state in transition dairy cows. By Hailemariam et al., page 2680. The aim of this investigation was to identify potential predictive biomarkers of disease in dairy cows using metabolomics approach. Blood samples were collected at 4 and 1 wk before and 1 and 4 wk after parturition from 6 cows affected by 4 different diseases and 6 healthy controls. Blood plasma samples were analyzed by direct flow injection mass spectrometry. We identified 5 biomarkers of disease several weeks before the beginning of clinical signs, suggesting that periparturient diseases in dairy cattle can be predicted before their development.


Stocking density, milking duration, and lying times of lactating cows on Canadian freestall dairy farms. By Charlton et al., page 2694. We examined the relationship between stocking density and time spent away from the home pen for milking on the lying behavior of lactating Holstein dairy cows on 111 Canadian dairy farms. Most farms did not overstock based on the Canadian Code of Practice requirements (i.e., 100 stalls for 120 cows). However, no farm with a stocking density greater than 100%, and no farm that kept the cows away from the home pen for longer than 3.7 h/d had lying times ≥12 h/d.

http://dx.doi.org/10.3168/jds.2013-6923.

Gene expression in liver and adipose tissue is altered during and after temporary changes to postpartum milking frequency. By Grala et al., page 2701. The effects of a short period of once- or thrice-daily milking, immediately postpartum, on lipid metabolism were investigated. Relative to twice-daily milking, cows milked once daily had increased expression of genes involved in fatty acid synthesis, re-esterification, and fatty acid oxidation, indicating improved energy status. Cows milked 3 times daily had reduced lipogenic gene expression, which was maintained even after being switched to twice-daily milking. Milking cows once or thrice daily affects gene transcription, which enables the animal to manage the energy demands associated with the change in milk production.


Changes in the dynamics of Coxiella burnetii infection in dairy cattle: An approach to match field data with the epidemiological cycle of C. burnetii in endemic herds. By Piñero et al., page 2718. Coxiella burnetii is the causative agent of Q fever, a worldwide re-emerging zoonosis whose main reservoirs are domestic ruminants. This study aimed to evaluate changes in the epidemiological status of C. burnetii in dairy cattle herds in order to better understand the epidemiology of the infection and to predict its evolution to improve pathogen control and human risk assessment. Observed changes in epidemiological status allowed us to depict a hypothetical life cycle of
C. burnetii within dairy cattle herds, which should be tested by future long-term series studies on C. burnetii infection to help fitting control measures (e.g., vaccination) to within-herd C. burnetii status. http://dx.doi.org/10.3168/jds.2013-7229.

Dairy cows seek isolation at calving and when ill. By Proudfoot et al., page 2731. As herd animals, dairy cows typically stay close to their group. We determined whether cows prefer isolation from the herd during calving and when ill. Cows were housed in individual pens in which the sides were covered with plywood to create a secluded corner. Most cows (79%) positioned themselves in the secluded corner to calve. When ill after calving, cows continued to use the corner more than healthy cows. These results provide insight into the design of maternity and hospital pens for dairy cows. http://dx.doi.org/10.3168/jds.2013-7274.

Genetic merit for fertility traits in Holstein cows: IV. Transition period, uterine health, and resumption of cyclicity. By Moore et al., page 2740. Cows that fail to adapt to the increased nutrient demands during the early lactation period exhibit poorer production, health, and fertility. This study monitored dry matter intake, milk production, metabolic status, uterine health, and the resumption of cyclicity in cows with divergent genetic merit for fertility traits but with similar genetic merit for milk production. High genetic merit for fertility traits was associated with greater postpartum dry matter intake, a more favorable metabolic status, superior uterine health status, and a quicker resumption of cyclicity. http://dx.doi.org/10.3168/jds.2013-7278.

Effects of short-term repeated exposure to different flooring surfaces on the behavior and physiology of dairy cattle. By Schütz and Cox, page 2753. Cows were exposed to different flooring surfaces for 4 consecutive days (18 h on surface/6 h on pasture) repeated 4 times. Cows on concrete spent less time lying and changed their gait pattern as a result of the 4-d exposure, and instead spent more time lying on pasture in between exposures compared with other surfaces. Cows on wood chips spent more time lying on this surface. The response of cows on 2 types of rubber mats was intermediate between responses on concrete and wood chips; however, cows on rubber mats were dirtier than those on the other surfaces. We observed no major effect of repeated exposure to the different surfaces. http://dx.doi.org/10.3168/jds.2013-7310.

Associations of cytological endometritis with energy metabolism and inflammation during the periparturient period and early lactation in dairy cows. By Yasui et al., page 2763. Cytological endometritis has been suggested to be associated with energy status and blood haptoglobin level during the periparturient period in dairy cows. The objective of the current study was to further characterize the previous energetic and inflammatory status of cows that subsequently developed cytological endometritis during early lactation. Negative energy balance and elevated concentrations of blood ketones for the first 3 wk postpartum predispose dairy cows to subsequent cytological endometritis; however, cytological endometritis was not associated with plasma haptoglobin concentrations. http://dx.doi.org/10.3168/jds.2013-7394.

Reproductive performance of lactating dairy cows managed for first service using timed artificial insemination with or without detection of estrus using an activity-monitoring system. By Frick et al., page 2771. Three management strategies for first artificial insemination (AI) using timed AI with or without detection of estrus using an activity-monitoring system were compared. Although treatment affected the rate at which cows were inseminated, treatment did not affect the proportion of cows pregnant by 300 d in milk. Based on an economic model, net present value ($/cow per year) was similar among the 3 treatments. A variety of strategies using a combination of AI based on increased activity using an activity-monitoring system and synchronization of ovulation and timed AI can be used to submit cows for first AI. http://dx.doi.org/10.3168/jds.2013-7366.

Multiple cases of methicillin-resistant CC130 Staphylococcus aureus harboring mecC in milk and swab samples from a Bavarian dairy herd. By Schlotter et al., page 2782. This is the first report of multiple cases of methicillin-resistant Staphylococcus aureus harboring the alternative methicillin resistance gene mecC in a single dairy herd. The detection of mecC-positive Staph. aureus in milk samples from 16 of 56 cows kept in a herd in Bavaria, Germany, shows that Staph. aureus that harbor mecC are able to spread among livestock and that they are not limited to individual cases. http://dx.doi.org/10.3168/jds.2013-7389.

The energy expenditure of 2 Holstein cow strains in an organic grazing system. By Thanner et al., page 2789. The $^{13}$C bicarbonate dilution technique was implemented in combination with an automatic blood sampling system to compare the energy expenditure of Swiss and New Zealand Holstein-Friesian cows in a pasture-based organic dairy system. No difference was found between the 2 breeds, but high cow-to-cow variation in energy expenditure indicates the potential to improve the efficiency of use of consumed energy (e.g., through animal selection). This improvement is important for the future sustainability of pasture-based organic milk production systems. http://dx.doi.org/10.3168/jds.2013-7393.
Effect of prepartum grouping strategy on displacements from the feed bunk and feeding behavior of dairy cows. By Lobeck-Luchterhand et al., page 2800. The objective of the current study was to examine whether providing a stable social group during the close-up prepartum period would alter the number of displacements from the feed bunk or feeding time compared with cows housed in traditional pen management with weekly entrance of new cows in a large dairy setting. With groups of Jersey cows and 92% feed bunk stocking density, the stable treatment reduced negative social behaviors; feeding times differed significantly from the traditional grouping strategy during 2 of the 5 observation weeks.
http://dx.doi.org/10.3168/jds.2013-7401.

How do cattle respond to sloped floors? An investigation using behavior and electromyograms. By Rajapaksha and Tucker, page 2808. This study evaluated how cattle responded to 90 min of standing on floors that varied in slope: 0, 3, 6, or 9%. Both the number of steps and the activity of the 2 hind leg muscles (biceps femoris and middle gluteal) increased over time, but did not differ among the slopes tested. This work demonstrated that electromyogram can be measured in cattle leg muscles; this tool, in combination with behavioral changes, may be useful in evaluating cow comfort in other situations, such as prolonged standing.
http://dx.doi.org/10.3168/jds.2013-7435.

Evaluation of gonadotropin-releasing hormone hydrogen chloride at 3 doses with prostaglandin F₂α for fixed-time artificial insemination in dairy cows. By Chenault et al., page 2816. Few studies have tested the use of gonadotropin-releasing hormone [hydrogen chloride (HCl) salt] or different doses of GnRH HCl >100 μg in fixed-time artificial insemination (FTAI) programs in dairy cows. This study evaluated doses of 100, 150, and 200 μg of GnRH, as the HCl salt, in FTAI programs and demonstrated the effectiveness and safety of all doses. No differences were detected by increasing the dose of GnRH above 100 μg in these FTAI programs.

Economic evaluation of participation in a voluntary Johne’s disease prevention and control program from a farmer’s perspective—The Alberta Johne’s Disease Initiative. By Wolf et al., page 2822. The Alberta Johne’s Disease Initiative is a voluntary Johne’s disease control program that aims to reduce the spread of the disease through implementation of best management practices. Cost effectiveness of participation in the program was estimated from the dairy farmer’s perspective. Costs for implementation of best management practices were outweighed by benefits arising through lower disease costs. This study will help producers to decide whether to implement biosecurity measures.
http://dx.doi.org/10.3168/jds.2013-7454.

Water footbath, automatic flushing, and disinfection to improve the health of bovine feet. By Fjeldaas et al., page 2835. Four controlled clinical studies were performed in 1 dairy herd to investigate effects on bovine feet of water footbath, copper sulfate (CuSO₄) footbath, water flushing, and flushing followed by disinfection. Interdigital dermatitis, heel horn erosion, locomotion, cleanliness of the claws, and hardness of the claw horn were recorded at trimming before and after all trials. The CuSO₄ footbath prevented heel horn erosion. The claw horn of those cows became harder and the claw horn of those flushed with water became softer compared with controls.
http://dx.doi.org/10.3168/jds.2013-7531.

Regulation of lipid droplet-associated proteins following growth hormone administration and feed restriction in lactating Holstein cows. By Faylon et al., page 2847. Lactating dairy cows mobilize body energy reserves when dietary energy intake does not meet their requirements for lactation and maintenance. Proper coordination and regulation of energy mobilization through lipolysis is essential for the maintenance of health and productivity of dairy cows. We investigated changes in proteins involved in the regulation of lipolysis, which is an essential prerequisite to understand the adaptive processes of periparturient cows. Our results reveal novel insights relative to the regulation of lipolysis and how such regulation differs according to the physiological status of the cow.

Evaluation of the effects of ultraviolet light on bacterial contaminants inoculated into whole milk and colostrum, and on colostrum immunoglobulin G. By Pereira et al., page 2866. Raw milk and colostrum may contain bacteria that can result in serious health issues in animals and humans. Most dairy calves in the United States are fed raw milk and colostrum. The objective of this study was to evaluate the use of ultraviolet light (UV) for killing bacteria in milk and colostrum. The effect of exposure of antibodies in colostrum to the UV treatment was also tested. The UV treatment effectively killed bacteria in milk; however, UV treatment of colostrum had limited effectiveness; UV treatment of colostrum may damage antibodies in colostrum.
http://dx.doi.org/10.3168/jds.2013-7601.

Effects of parturition and feed restriction on concentrations and distribution of the insulin-
like growth factor-binding proteins in plasma and cerebrospinal fluid of dairy cows. By Laeger et al., page 2876. Hormones and metabolites act as satiety signals in the brain and can reach the hypothalamus and brainstem, 2 major centers of feed intake regulation, via cerebrospinal fluid (CSF). Insulin-like growth factor (IGF)-1 is a potential effector of feed intake in beef calves. The aim of this study was to elucidate plasma and CSF for the presence of IGF-binding proteins (IGFBP) during the periparturient period and in response to feed restriction of dairy cows. During negative energy balance, we did not detect altered levels of IGFBP in the CSF aspirated from the brains of dairy cows. Elevated plasma concentrations of IGFBP-2 and IGFBP-4 and reduced plasma concentrations of IGF-I may suggest an endocrine response against negative energy balance during early lactation.

http://dx.doi.org/10.3168/jds.2013-7671.

Dynamics of culling for Jersey, Holstein, and Jersey × Holstein crossbred cows in large multibreed dairy herds. By Pinedo et al., page 2886. The objective was to describe and compare the dynamics of reason-specific culling risk for Jerseys (JE), Holsteins (HO), and Jersey × Holstein crossbreds (JH) in large multibreed dairy herds in Texas. Overall, JH crosses had the lowest annualized culling rate, followed by JE. The dynamics of reason-specific culling were dependent on genetic group, parity, stage of lactation, milk yield, and herd characteristics. Across breeds, early lactation was a critical period for “died”, “any sickness,” and “injury-sick” culling. The risk increased with days after calving for “reproduction” and “low production” (particularly for HO) culling. Overall, reason-specific culling followed similar patterns across days in milk in the 3 genetic groups.

http://dx.doi.org/10.3168/jds.2013-7685.

Agreement between milk fat, protein, and lactose observations collected from the Dairy Herd Improvement Association (DHIA) and a real-time milk analyzer. By Kaniyamattam and De Vries, page 2896. The Afilab (Afmilk, Kibbutz Afikim, Israel) real-time milk analyzer measures the fat, protein, and lactose content of an individual cow’s milk at each milking. Agreement between Afilab and monthly Dairy Herd Improvement Association (DHIA) observations was analyzed for 10,273 milkings divided over 23 mo on 1 farm. Correlations ranged from 0.34 to 0.72 for fat, 0.57 to 0.75 for protein, and 0.26 to 0.54 for lactose, and bias was small. The Afilab measures for fat, protein, and lactose may be helpful to characterize milk components in an individual cow’s milk.

http://dx.doi.org/10.3168/jds.2013-7690.

Effect of short dry period on milk yield and content, colostrum quality, fertility, and metabolic status of Holstein cows. By Shoshani et al., page 2909. Dry periods (DP) of 60 and 40 d were examined in 5 commercial dairy herds. Milk and energy-corrected milk (ECM) yields were similar for both DP in primiparous cows but significantly lower for 40-d DP in multiparous cows. When the milk yield of ~20 d from the previous lactation was added, milk and ECM yields for 40-d DP cows were significantly higher in all herds. Examining DP length in 2 consecutive years revealed no difference in milk or ECM yields between groups. Adoption of a short (~40-d) DP in dairy herds might have beneficial effects on herd economics, fertility, and energy balance.

http://dx.doi.org/10.3168/jds.2013-7733.

Peripartal progesterone and prolactin have little effect on the rapid transport of immunoglobulin G into colostrum of dairy cows. By Gross et al., page 2923. Endocrine changes (progesterone and prolactin in plasma) approaching parturition were evaluated to determine the effect on colostrum yield and composition. Experimental dairy cows were milked at around 24 h prepartum and then again at 4 h postpartum. Cows milked once prepartum showed an accelerated recovery of immunoglobulin transfer and increased secretory activity indicated by the increase in fat and lactose in milk obtained at the postpartum milking compared with controls that were milked once at 4 h postpartum. The rapid movement of immunoglobulin into colostrum of prepartum milked cows indicates that the transfer can be very fast and continues until parturition with only minor effects exerted by plasma progesterone and prolactin concentration.

http://dx.doi.org/10.3168/jds.2013-7795.

Treatment with a nonsteroidal antiinflammatory drug after calving did not improve milk production, health, or reproduction parameters in pasture-grazed dairy cows. By Meier et al., page 2932. Mixed-aged grazing dairy cows were treated with a propionic acid-based nonsteroidal anti-inflammatory drug (NSAID; e.g., carprofen) in either the first or the third week after calving. Milk production, reproductive parameters, and metabolic indicators of health were not affected by treatment, although the number of cows bred in the first 3 wk of the seasonal breeding season was greater in cows treated with the NSAID during wk 3 postcalving. These results do not support the blanket use of this particular NSAID during early lactation as a way to improve health and production.

http://dx.doi.org/10.3168/jds.2013-7838.

Short communication: Timing of first milking affects serotonin (5-HT) concentrations. By Laporta et al., page 2944. Early milking (approximately 1 d precalving) decreased cows’ serum serotonin (5-HT)
levels, but increased colostral and calf serum 5-HT concentrations compared with cows only milked post-calving. Serum ionized calcium levels decreased upon initiation of milking and paralleled the response seen in 5-HT concentrations. Pre-calving milking may be involved in removing inhibitory effects of 5-HT on mammary epithelial cells and stimulating its transfer to the calf via colostrum and during pregnancy via placental transfer.

http://dx.doi.org/10.3168/jds.2013-7336.

**Short communication:** Prediction of retention pay-off using a machine learning algorithm. By Shahinfar et al., page 2949. Replacement decisions have a major effect on dairy farm profitability. Dynamic programming has been widely studied to determine optimal replacement policies in dairy cattle, but this method is not user friendly and therefore not extensively applied in farm decision making. We explored the ability of machine learning to mimic the behavior of a dynamic programming model, in order to provide fast and accurate predictions of nonlinear and inter-correlated variables. Machine learning in conjunction with dynamic programming is an efficient method for assessing the value of keeping or culling specific cows and helping farmers make economical replacement decisions.


**Short communication:** Automatic detection of social competition using an electronic feeding system. By Huzzey et al., page 2953. Competition at the feed bunk can be a welfare and health risk for group-housed dairy cows. We developed a method of using data from an electronic feed monitoring system, designed to record feeding time, to assess social competition at the feeder. Short intervals (≤26 s) between the feeding events of 2 cows at 1 bin were associated with competitive replacements at the feed bin (when a cow displaced a feeding cow and took her place, as identified using video). Automated methods of assessing social behavior may be useful for improving dairy herd management.

http://dx.doi.org/10.3168/jds.2013-7434.

**Short communication:** Prevalence of methicillin resistance in coagulase-negative staphylococci and *Staphylococcus aureus* isolated from bulk milk on organic and conventional dairy farms in the United States. By Cicconi-Hogan et al., page 2959. Organic dairy production is one of the most rapidly emerging agricultural sectors in the United States, and the specifics of organic dairy production with regard to antimicrobial resistance are of interest. The goal of this study was to investigate the presence of methicillin-resistant staphylococci in organic and conventional bulk tank milk throughout New York, Oregon, and Wisconsin. The presence of a potential methicillin-resistant *Staphylococcus* reservoir in milk, and likely the dairy farm population in the United States, is independent of the organic or conventional production system.

http://dx.doi.org/10.3168/jds.2013-7523.

**Short communication:** Bacterial counts in recycled manure solids bedding replaced daily or deep packed in freestalls. By Sorter et al., page 2965. Managing bedding after it is placed into stalls appears to have a greater effect on bacterial populations compared with preparatory measures during the reclaiming of solids from manure. An experiment was conducted to compare bacterial counts of mastitis pathogens in deep-packed manure solids bedding with those in manure solids bedding replaced daily from mattresses. Daily replacement of recycled manure bedding from the back one-third of stalls appears to be an effective approach to reducing exposure to coliforms, specifically *Klebsiella*, but not streptococci.


**Technical note:** Effects of frozen storage on the mechanical properties of the suspensory tissue in the bovine claw. By Boettcher et al., page 2969. Lameness and claw lesions in cattle have a large effect on both animal welfare and economics. Some types of claw lesions have been associated with softening of the tissue suspending the pedal bone in the claw capsule. Research within this area would be greatly aided if mechanical testing of the suspensory tissue did not have to be performed on fresh specimens. Freezing had no significant effect on the strength and elasticity of the suspensory tissue in the bovine claw.


**Technical note:** Evaluation of an ear-attached movement sensor to record cow feeding behavior and activity. By Bikker et al., page 2974. The ability to monitor dairy cow behavior could improve dairy herd management. This study evaluated a sensor attached to the cow’s ear, which enabled continuous monitoring of feeding behavior and activity. Behavior of 15 Holstein-Friesian cows was recorded by sensor and visual observation for a period of approximately 20 h per cow. We achieved strong agreement between sensor and visual observation for ruminating and resting. The sensor shows promise in monitoring eating behavior, whereas more work is needed to monitor activity of dairy cows.

http://dx.doi.org/10.3168/jds.2013-7560.

**Supplemental fat for dairy calves during mild cold stress.** By Litherland et al., page 2980. Pre-weaned dairy calves were fed calf milk replacer (MR) and increasing amounts of supplemental fat during mild
cold stress. Supplemental fat increased metabolizable energy intake (MEI) above maintenance requirements, increased body weight (BW) gain during wk 1 to 3, and gain:feed through d 49. Supplemental fat decreased starter intake until weaning and decreased efficiency of conversion of BW gain:MEI. Lack of increase in BW gain and feed efficiency between medium- and high-fat treatments indicated that the high-fat treatment did not result in advantages over the medium-fat treatment. The addition of supplemental fat to low-fat treatment during mild cold stress may result in a suboptimal calf MR ratio of crude protein to metabolizable energy.

http://dx.doi.org/10.3168/jds.2013-6942.

Efficacy of on-farm use of ultraviolet light for inactivation of bacteria in milk for calves. By Gelsinger et al., page 2990. Milk samples were collected from 9 dairy farms before and after ultraviolet light treatment. All samples were analyzed for standard plate count, coliforms, noncoliforms, gram-negative bacteria, environmental and contagious streptococci, coagulase-negative staphylococci, Streptococcus agalactiae, and Staphylococcus aureus counts, and total solids percentage, log reduction, and percentage log reduction were calculated. Bacteria populations were effectively reduced in 6 of 8 bacteria types evaluated; 43 and 94% of samples collected after ultraviolet treatment met recommended bacterial standards for milk for feeding calves.

http://dx.doi.org/10.3168/jds/2013-7260.

Casein synthesis is independently and additively related to individual essential amino acid supply. By Arriola Apelo et al., page 2998. Nutrient requirement systems for dairy cattle are based on the single-limiting amino acid (AA) theory, which hypothesizes that if one AA is limiting production, the addition of only that AA can cause a response. In this study, individual essential AA stimulated milk casein synthesis by mammary tissue additively, and the responses were saturable within biological ranges, which implies variable efficiency of AA conversion to milk protein.


Relationship of severity of subacute ruminal acidosis to rumen fermentation, chewing activities, sorting behavior, and milk production in lactating dairy cows fed a high grain diet. By Gao and Oba, page 3006. Substantial variation exists in the severity of subacute rumen acidosis (SARA) among lactating dairy cows, even when they are fed identical high-grain diets. Cows that are tolerant to a high-grain diet sorted feed to a less extent, spent less time chewing, and had higher milk urea nitrogen (MUN) concentration compared with susceptible cows. Lactating dairy cows vary markedly in their ability to cope with the dietary factors that predispose them to SARA. In addition, MUN values may be used as a noninvasive indicator to identify cows that are tolerant to high-grain diets on farm.


Effect of prepubertal and postpubertal growth and age at first calving on production and reproduction traits during the first 3 lactations in Holstein dairy cattle. By Krpálová et al., page 3017. Relationships between growth rate and subsequent reproduction and production parameters need to be evaluated for effective dairy farm management. The objective of the study was to analyze the effect of body condition score, body weight, average daily weight gain, and age at first calving of Holstein heifers on performance of subsequent 3 lactations. The age at first calving depends on rearing intensity and the objective is usually to make this period as short as possible. An age at first calving of less than 23 mo did not negatively affect milk yield or reproduction parameters during the first 3 lactations.


Short-term response in milk production, dry matter intake, and grazing behavior of dairy cows to changes in postgrazing sward height. By Ganche et al., page 3028. As variable climatic conditions exist in late spring, postgrazing height may have to be adjusted to facilitate fluctuations in spring grass supply. Dairy cows are highly responsive to an increase or decrease in postgrazing height and can change their milk yield accordingly. These results provide practical information for dairy farmers to aid decision making in early lactation.

http://dx.doi.org/10.3168/jds.2013-7475.

Responses of late-lactation cows to forage substitutes in low-forage diets supplemented with by-products. By Hall and Chase, page 3042. When forage is limited or feed prices are high, it would be useful to know diet formulation options: how do cows perform on low-forage diets with forage substitutes and lower cost by-products? Late-lactation cows maintained performance when switched from corn, soy, and 61% forage diets to diets containing 40% forage from alfalfa and corn silages and 12% as varying combinations of sugar beet pulp and wheat straw. No corn or soy products were supplemented, only corn gluten feed, distillers grains, whole cottonseed, and molasses. Feed efficiency was reduced, but the nontraditional diets are a viable short-term option.

http://dx.doi.org/10.3168/jds.2013-7539.

Effects of an exogenous protease on the fermentation and nutritive value of corn silage harvested at different dry matter contents and ensiled for various lengths of time. By Windle et al., page 3053. Adding a high level of an exogenous
protease to early- and late-harvested corn plants stimulated proteolytic processes during ensiling that resulted in higher ruminal in vitro starch digestibility compared with untreated corn plants. Exogenous proteases used as silage additives have the potential to improve the nutritive value of corn silages.

http://dx.doi.org/10.3168/jds.2013-7586.

**Diurnal variations of progesterone, testosterone, and androsta-1,4-diene-3,17-dione in the rumen when fed 1 of 5 total mixed rations with different forage combinations.** The in vitro experiment confirmed that mixed rumen microorganisms showed good ability to transform progesterone into testosterone and androsta-1,4-diene-3,17-dione, depending on incubation time and the level of progesterone presented.


**Evaluating the effect of ration composition on income over feed cost and milk yield.** By Buza et al., page 3073. The effect of ration components and feed costs on the net margins and milk yields were determined using the Penn State income over feed cost Excel spreadsheet. Data from 95 Pennsylvania dairy farms, from 2009 to 2012, were analyzed. The inclusion of commodity by-products and monitoring of ration formulation and cost resulted in higher income over feed cost and milk yield.

http://dx.doi.org/10.3168/jds.2013-7622.

**Effects of feeding various dosages of Saccharomyces cerevisiae fermentation product in transition dairy cows.** By Zaworski et al., page 3081. We evaluated the effects of feeding 0, 56, or 112 g/d of Saccharomyces cerevisiae fermentation product on supplement intake, milk production and composition, and serum concentrations of macrominerals, acute-phase proteins, immunoglobulins, metabolites, and hormones in transition dairy cows. Changes in serum analytes suggest that feeding Saccharomyces cerevisiae fermentation product may have a dosage-independent beneficial effect in supporting physiologic changes after parturition, resulting in higher milk production and lower milk somatic cell counts in early lactation.


**Group housing of Holstein calves in a poor indoor environment increases respiratory disease but does not influence performance or leukocyte responses.** By Cobb et al., page 3099. The effects of individual versus group housing on performance, health, and leukocyte responses of dairy calves depend on many environmental and management variables. Housing calves in groups of either 2 or 3 per pen in a poor environment tended to increase respiratory disease. Group housing did not affect performance or leukocyte responses of calves, but group-housed calves relied more on calf-to-calf interactions than on calf-to-human interactions.

http://dx.doi.org/10.3168/jds.2013-7823.

**Short communication: Decrease in rumination time as an indicator of the onset of calving.** By Büchel and Sundrum, page 3120. Knowledge about when the birthing process begins is essential for successful management of dairy cattle, particularly in situations when cows experience dystocia. We investigated whether rumination time decreased shortly before calving and whether a relationship existed between feeding time and dry matter intake before calving. Rumination, feeding time, and dry matter intake all declined in the hours leading up to calving, providing evidence that these feeding behaviors, especially rumination time, can serve as a useful tool for predicting when cows are about to give birth.


**Extent of linkage disequilibrium, consistency of gametic phase, and imputation accuracy within and across Canadian dairy breeds.** By Larmer et al., page 3128. Linkage disequilibrium (LD) was measured in 5 dairy breeds using the 50K (~50,000) single nucleotide polymorphism (SNP) panel and in 3 breeds using the 777K (~777,000) SNP panel. Gametic phase consistency was then measured across breeds. Imputation from ~6,000 and 50K to 777K was carried out and imputation accuracies were calculated. A high level of LD was found in all breeds using 777K genotypes. Gametic phase was highly consistent across all breed pairs, meaning across-breed selection could be possible with 777K genotypes and novel genomic prediction methods. Imputation could be accurately carried out from lower density panels to 777K, decreasing the cost of genomic selection.


**Genetic parameter estimation for major milk fatty acids in Alpine and Saanen primiparous goats.** By Maroteau et al., page 3142. This paper reports the first genetic parameter estimations for FA in goat milk based on mid-infrared spectra estimates. Heritability estimates ranged from 0.18 to 0.49 for FA in Saanen and Alpine breeds, showing substantial genetic variation in goat milk FA. Genetic correlations between milk, fat, protein, and FA content indicate that current selection is not expected to have an undesirable effect on the FA profile regarding the specificity of goat products and human health.

http://dx.doi.org/10.3168/jds.2013-7328.
A genome-wide association study of calf birth weight in Holstein cattle using single nucleotide polymorphisms and phenotypes predicted from auxiliary traits. By Cole et al., page 3156. A selection index for estimating predicted transmitting abilities (PTA) for birth weight (BW) from PTA for calving traits, gestation length, and conformation traits was developed using German data. The index was updated using US (co)variances and applied to the national dataset. A high-density genome scan was carried out to search for major genes affecting BW, and several genes associated with developmental processes were identified using the genetic markers with the largest effects on BW. Our data provide strong evidence that a gene on Bos taurus autosome 18 affects the size of calves at birth. http://dx.doi.org/10.3168/jds.2013-7409.

Prediction of liveweight of cows from type traits and its relationship with production and fitness traits. By Haile-Mariam et al., page 3173. Correlations of liveweight (LWT) with production and fitness traits were estimated in an attempt to understand the consequences of continuous selection on an economic index that includes negative weighting on predicted LWT. Different measures of LWT predicted from type traits were positively genetically correlated with milk production traits. The genetic relationships of predicted LWT with fertility traits and survival were favorable or close to zero, indicating that inclusion of predicted LWT with negative economic values into the breeding objective will not have negative effects on fitness traits. http://dx.doi.org/10.3168/jds.2013-7516.

Genomic selection for producer-recorded health event data in US dairy cattle. By Parker Gaddis et al., page 3190. A negative relationship of production with fitness traits, including health and fertility, has become apparent due to an emphasis on production. Improvement of health traits through genomic selection is an appealing tool, but no consistent recording system exists for health data in the United States. The lack of documented phenotypes in the United States poses a challenge for genomic evaluation of health traits, but producer-recorded data may be able to fill this void. The current study sought to incorporate genomic data with health data collected from on-farm computer systems to estimate variance components andheritabilities for health traits commonly experienced by dairy cows. All health traits had a genetic component and that genomic data improved reliability of estimates. http://dx.doi.org/10.3168/jds.2013-7543.

Within- and across-breed genomic predictions and genomic relationships for Western Pyrenees dairy sheep breeds Latxa, Manech, and Basco-Béarnaise. By Legarra et al., page 3200. Dairy sheep in the Western Pyrenees include several breeds (Black and Blond-Faced Latxa in Spain; Black and Blond-Faced Manech, and Basco-Béarnaise in France) with exchanges of genetic materials going from sporadic to frequent. Using marker information, we showed that the structure of the breeds reveals historical and recent exchanges; connections across breeds are nevertheless not strong enough to consider them a single population. Genomic predictions were more accurate than pedigree-based ones and make genomic selection of interest for dairy sheep. Multiple breed predictions marginally increased the accuracy. http://dx.doi.org/10.3168/jds.2013-7745.

Short communication: Use of young bulls in the United States. By Hutchison et al., page 3213. Availability of genomic evaluations of dairy cattle in the United States since 2008 has resulted in many changes in breeding programs. The increased use of young bulls in breeding programs is one of the more notable changes resulting from genomic selection and is associated with a reduced generation interval and an increased rate of genetic gain. In 2012, 51% of Holstein and 52% of Jersey matings were to bulls younger than 4 yr of age. Holstein and Jersey herds using >75% of young bulls had a +52 and +142 kg increase for milk predicted transmitting ability, respectively, compared with herds using no young bulls. http://dx.doi.org/10.3168/jds.2013-7525.

Relationships between dry matter content, ensiling, ammonia-nitrogen, and ruminal in vitro starch digestibility in high-moisture corn samples. By Ferraretto et al., page 3221. Starch digestibility in dairy cows is generally greater for high-moisture corn than for dry corn. Starch digestibility of high-moisture corn, however, is highly variable in regard to harvest and storage practices. The objective of this study was to examine relationships between dry matter content, ensiling, ammonia-N, and ruminal in vitro starch digestibility for high-moisture corn in a dataset of commercial laboratory samples. Starch digestibility, ammonia-N and soluble crude protein (CP) concentrations were greater and pH lower when high-moisture corn was harvested with lower dry matter content or was ensiled for an extended period. Ammonia-N, soluble CP, dry matter, and pH are good indicators of in vitro starch digestibility for high-moisture corn. http://dx.doi.org/10.3168/jds.2013-7680.