A new magnetic resonance imaging approach for discriminating Sardinian sheep milk cheese made from heat-treated or raw milk. By Mulas et al., page 7393. Magnetic resonance imaging (MRI) analysis on ewe milk cheese gives evidence of the heat treatment to which the milk has been subjected. Because the water state in cheese is significantly influenced by cheese structure (i.e., by water chemical and physical environment), the magnetic properties of water protons provide detailed indications on cheese at the molecular level. Heat treatments induce micro-structural rearrangements in milk components and the structure of the cheese network changes as well. The MRI properties of water protons reflect these changes. We demonstrated our hypothesis on Fiore Sardo cheese but the findings are generally valid.


Effect of pH on technological parameters and physicochemical and texture characteristics of the pasta filata cheese Telita. By Maldonado et al., page 7414. Telita cheese is very popular in Venezuela. Its manufacturing consists of the preacidification of milk to obtain a stretchable curd that is subjected to heat. We evaluated the effect of stretching pH on technological parameters and physicochemical and texture characteristics of Telita cheese. We observed an inverse relationship between pH and acidity and a direct relationship between melting and stretching temperature. The yield was highest as the pH increased. Variation in texture existed among cheeses with different stretching pH. Overall, cheeses with stretching pH of 5.4 and 5.5 showed a balanced texture with a high retention of solid components.

http://dx.doi.org/10.3168/jds.2013-6887.

Monitoring the ripening process of Cheddar cheese based on hydrophilic component profiling using gas chromatography-mass spectrometry. By Ochi et al., page 7427. Three types of Cheddar cheeses, with different salt contents and lactic acid bacteria starters, were manufactured. Metabolomic analysis using gas chromatography-mass spectrometry targeting hydrophilic low-molecular-weight compounds combined with multivariate analysis was used to investigate the ripening process and revealed the effect of ingredients and ripening conditions on the cheese metabolic profile.

http://dx.doi.org/10.3168/jds.2013-6897.

Sensory properties and drivers of liking for Greek yogurts. By Desai et al., page 7454. The sensory properties and drivers of liking of Greek yogurts were determined. Consumers preferred Greek yogurts with a firm, dense texture, moderate sweet aromatic, milkfat, and dairy sour flavors, and moderate sour taste. Consumers were aware of the increased protein content of Greek yogurts but generally were unaware of differences between strained versus fortified Greek yogurts. These results suggest that successful Greek yogurts can be manufactured using addition of dried dairy ingredients or by traditional straining and centrifugation.


Effects of Lactobacillus kefiranofaciens M1 isolated from kefir grains on enterohemorrhagic Escherichia coli infection using mouse and intestinal cell models. By Chen et al., page 7467. Kefir is an alcoholic fermented milk beverage with many health benefits. However, probiotic bacteria strains responsible for the effects are largely unknown. In this study, we found that administration of a potential probiotic Lactobacillus kefiranofaciens M1 isolated from kefir grains was able to reduce the severity of enterohemorrhagic Escherichia coli infection in a mouse model. Possible mechanisms included the enhancement of mucosal immunity and improvements in intestinal barrier functionality. Thus, Lb. kefiranofaciens M1 might be useful as an alternative way of preventing enteric pathogen infections.

http://dx.doi.org/10.3168/jds.2013-7015.

Effects of mineral content of bovine drinking water: Does mineral content affect milk quality? By Mann et al., page 7478. Water is an important nutrient for dairy cattle; however, influences of water chemistry on milk synthesis are not well described. High mineral concentrations (>0.3 mg/kg of Fe and other metals) in bovine drinking water result from natural sources in ground water, runoff from contaminating sources, drought, or water storage systems. This study evaluated the effects of added iron in bovine drinking water on processed milk quality. Iron solutions infused in the abomasum of dairy cattle did not show an effect on oxidative stability. However, differences in milk flavor from indirect (infusion) addition of iron-contaminated water were detected.


High-pressure processing decelerates lipolysis and formation of volatile compounds in ovine milk blue-veined cheese. By Calzada et al., page 7500. Blue-veined cheese was pressurized at 400 or 600 MPa on d 21, 42, or 63 of ripening to control excessive lipolysis and formation of volatile compounds that could cause over-ripening and off-flavors during the refrigerated storage of ripe cheese before consumption. The cheese pressurized at 600 MPa on d 21 showed the lowest concentration of free fatty acids on d 360 (as low
as those of control cheese on d 90) and the lowest levels of most volatile compounds on d 180 and 360. No flavor defects were recorded in pressurized or control cheeses. 


**Bovine lactoferricin B induces apoptosis of human gastric cancer cell line AGS by inhibition of autophagy at a late stage.** By Pan et al., page 7511. Development of an effective therapeutic method for gastric cancer without side effects is urgently needed. We prepared a series of peptide fragments derived from bovine lactoferrin and evaluated their anticancer potency toward the gastric cancer cell line AGS. A 25-amino acid peptide of lactoferricin B (LFcinB25)-induced apoptosis by inhibition of autophagy at the final stage. These findings provided support for future application of LFcinB25 as a potential therapeutic agent for gastric cancer.

http://dx.doi.org/10.3168/jds.2013-7285.

**Short communication: Feeding linseed oil to dairy goats with competent reticular groove reflex greatly increases n-3 fatty acids in milk fat.** By Martínez Marín et al., page 7532. Lactating goats, trained to maintain their inborn reticular groove reflex, received a daily dose of linseed oil either with their solid feed or emulsified in skimmed milk and bottle-fed. The bottle-fed goats showed high levels of α-linolenic acid and very low levels of rumen biohydrogenation isomers in milk fat; levels of short- and medium-chain saturated fatty acids were similar to or lower than those of goats fed linseed oil mixed in the solid feed. Successful research to translate this animal model into practical farm conditions could enable farmers to produce milk naturally enriched in beneficial fatty acids.

http://dx.doi.org/10.3168/jds.2013-7041.

**Characterization of clinical mastitis occurring in cows on 50 large dairy herds in Wisconsin.** By Oliveira et al., page 7538. Mastitis is one of the most important diseases occurring in dairy cows. This study characterized the occurrence of clinical mastitis in cows on 50 large dairy herds in Wisconsin. Of 741 clinical mastitis cases, environmental pathogens were the most frequent pathogens isolated, and 27.3% of cases had no pathogens recovered. Bacteriological cure, recurrence of clinical mastitis, and risk of culling differed among pathogens. Of 583 cases with severity reported, the distribution of clinical mastitis cases with mild, moderate, and severe signs was 47.8, 36.9, and 15.3%, respectively. The results of this study can help veterinarians and dairy producers better understand the epidemiology of clinical mastitis occurring on modern commercial dairy farms.

http://dx.doi.org/10.3168/jds.2012-6078.

**Randomized clinical trial of tetracycline hydrochloride bandage and paste treatments for resolution of lesions and pain associated with digital dermatitis in dairy cattle.** By Hygginson Cutler et al., page 7550. A randomized clinical trial was conducted to assess healing and recurrence of digital dermatitis lesions treated with tetracycline hydrochloride in either a paste formula or bandage compared with a negative control. Pain at the lesion site was assessed through use of pressure algometry. No difference in healing was observed between paste and bandage treatments, demonstrating that the paste is effective and eliminates the need for bandage removal. Cows with active lesions responded to a range of pressure, and cows would tolerate more pressure with an algometer as lesions healed. Digital dermatitis has been shown to be painful when active; therefore, pain management should be considered.


**Dynamic changes in antibody levels as an early warning of Salmonella Dublin in bovine dairy herds.** By Stockmarr et al., page 7558. The bacterium Salmonella Dublin causes illness, production losses, and death in cattle worldwide. Rapid detection of emerging infections is vital for control measures to minimize disease spread and adverse effects. Since 2001, all Danish dairy herds have been tested for Salmonella Dublin every 3 mo, using measurements of antibodies in bulk tank milk to assign an infection category. We present a statistical method that may form a significant contribution to early warning systems for Salmonella Dublin. Implementation and communication of alarm herd status may allow farmers to counter a disease outbreak 3 mo earlier than under the current practice.

http://dx.doi.org/10.3168/jds.2012-6384.

**Long-acting insulins alter milk composition and metabolism of lactating dairy cows.** By Winkelman and Overton, page 7565. Two forms of long-acting insulin commonly used in treatment of human diabetes were administered over a period of 10 d to elevate insulin activity in lactating dairy cows in order to study the effects of insulin on milk composition. Milk protein and fat synthesis tended to be increased in cows treated with long-acting insulins; some responses were slightly more pronounced in one of the forms studied, likely related to its temporal pattern of activity. Long-acting insulins can be used experimentally without exogenous glucose administration. Furthermore, strategies to enhance insulin concentrations or the responses of mammary protein synthesis to insulin warrant investigation.

http://dx.doi.org/10.3168/jds.2012-6498.

**Risk factors associated with bulk tank standard plate count, bulk tank coliform count, and the**
The presence of *Staphylococcus aureus* on organic and conventional dairy farms in the United States. By Cicconi-Hogan et al., page 7578. The organic dairy industry is one of the fastest growing agricultural sectors in the United States. More detailed information on factors associated with milk quality and best management practices in the organic dairy industry are needed. The goal of this study was to associate management variables with bulk tank standard plate count, *Staphylococcus aureus*, and coliform counts on organic and conventional dairy farms.

http://dx.doi.org/10.3168/jds.2013-6505.

Expression of adipokine and lipid metabolism genes in adipose tissue of dairy cows differing in a female fertility quantitative trait locus. By Elis et al., page 7591. A strong degradation has been observed in dairy cow fertility since the 1980s, especially in the Holstein breed. In dairy cows, negative energy balance during early lactation leads to a competitive situation among milk yield, fertility, and health, traits that meet energy requirement. By studying adipose tissue gene expression in cows differing in fertility, we showed that ADIPOQ and ADIPOR2, two genes involved in fatty acid oxidation as well as in reproduction, were significantly overexpressed in less fertile cows. This overexpression may be partly responsible for the decrease of fertility in dairy cows.

http://dx.doi.org/10.3168/jds.2013-6615.

Interdigital dermatitis, heel horn erosion, and digital dermatitis in 14 Norwegian dairy herds. By Knappe-Poindecker et al., page 7617. This study assessed herds suffering from interdigital dermatitis and heel horn erosion as well as control herds expected to have healthy feet. Infectious foot diseases were recorded in 633 cows from 14 herds. Swabs and biopsies were collected from 34 cows with interdigital dermatitis, 11 with heel horn erosion, 40 with both interdigital dermatitis and heel horn erosion, 8 with digital dermatitis, and 47 with healthy feet. Our results indicate that *Dichelobacter nodosus*, *Treponema* spp., and poor hygiene are involved in the pathogenesis of interdigital dermatitis.


Reproductive performance of dairy cows resynchronized after pregnancy diagnosis at 31 (±3 days) after artificial insemination (AI) compared with resynchronization at 31 (±3 days) after AI with pregnancy diagnosis at 38 (±3 days) after AI. By Pereira et al., page 7630. Reproductive management of dairy cows can directly affect farm profitability. The objective of this study was to compare the effect on reproductive performance and pregnancy loss of 2 pregnancy diagnosis protocols: pregnancy diagnosis performed 31 ± 3 d after artificial insemination (AI) by ultrasonography versus resynchronization started 31 ± 3 d after AI but with pregnancy diagnosis performed 38 ± 3 d after AI by palpation per rectum. Overall, the reproductive performance of cows diagnosed for pregnancy by ultrasonography or palpation per rectum did not differ.

http://dx.doi.org/10.3168/jds.2013-6723.

Pregnancy per artificial insemination in lactating dairy cows subjected to 2 different intervals from presynchronization to initiation of Ovsynch protocol. By Colazo et al., page 7640. This study examined the efficacy of reducing the interval between the end of presynchronization and initiation of Ovsynch treatment from 12 to 9 d on ovarian responses to treatments and pregnancy per artificial insemination (AI) in lactating Holstein cows. Reducing the interval by 3 d did not affect the proportion of cows that ovulated after first and second gonadotropin-releasing hormone injections but did reduce response to prostaglandin F2α and pregnancy per AI at 32 and 60 d after timed AI, particularly in primiparous cows.

http://dx.doi.org/10.3168/jds.2013-6750.

Effects of weekly regrouping of prepartum dairy cows on innate immune response and antibody concentration. By Silva et al., page 7649. Stressors result in diverse biological responses, including immune and neuroendocrine responses. These biological responses to stress may or may not result in alterations in biological functions and occurrence of diseases. Innate immune response and concentration of antibodies of cows subjected to a stable prepartum grouping strategy (no entrance of new cows in the prepartum pen) were similar to that of cows submitted to a traditional prepartum grouping strategy (weekly entrance of new cows in the prepartum pen). Treatment resulted in minor changes in concentration of cortisol, but parameters related to metabolism were not altered. Thus, reducing social stress during the prepartum period may not decrease incidence of health disorders.

http://dx.doi.org/10.3168/jds.2013-6752.

The effect of prepartum intravaginal bacteriophage administration on the incidence of retained placenta and metritis. By Meira et al., page 7658. Uterine postpartum diseases in dairy cattle result in impaired reproductive performance and economic losses in dairy herds. The objective of this study was to evaluate the effect of a prophylactic prepartum treatment consisting of the intravaginal administration of 20 mL of an anti-*Escherichia coli* bacteriophage cocktail on uterine health and reproductive performance of lactating dairy cows. The prophylactic treatment had a negative effect on uterine health and reproduction.
Identification of virulence factors in 16S–23S rRNA intergenic spacer genotyped *Staphylococcus aureus* isolated from water buffaloes and small ruminants. By Cremonesi et al., page 7666. This paper describes the genotyping of 71 *Staphylococcus aureus* isolates from bulk tank, foremilk, and udder tissue of water buffaloes and small ruminants, using a method based on the amplification of the 16S–23S rRNA intergenic spacer region. The presence of 19 virulence-associated genes was also investigated by specific polymerase chain reactions.


Purinergic signaling gene network expression in bovine polymorphonuclear neutrophils during the peripartal period. By Seo et al., page 7675. The purinergic receptors P1 and P2, members of the G-protein coupled receptor family, bind adenosine or adenosine triphosphate (ATP) released by polymorphonuclear leukocytes in response to inflammatory stimuli. We found upregulation of expression of the ATP receptor P2RY2 on d 3 versus d −10 relative to calving but downregulation of genes encoding cell adhesion, chemoattractant receptors, and adenosine receptors. The decrease was related to an increase in blood nonesterified fatty acids and β-hydroxybutyrate. These changes might be important in terms of the control of polymorphonuclear leukocyte function during the transition period.


Rapid, quantitative analysis of 3′- and 6′-sialyllactose in milk by flow-injection analysis–mass spectrometry: Screening of milks for naturally elevated sialyllactose concentration. By Kelly et al., page 7684. Sialyllactoses are sugars present in cow milk that have antimicrobial activity. We identified cows that naturally produce higher concentrations of sialyllactose in their milk. To achieve this, we developed a rapid method for measuring sialyllactose and then measured the concentrations of 2 forms of sialyllactose in milk in samples from over 15,000 cows. We found over 300 cows with milk containing 2 to 4 times the usual concentration of sialyllactose. Milk from these cows could be used to produce foods, such as infant formula, with higher concentrations of sialyllactose, which could provide increased health benefits.

http://dx.doi.org/10.3168/jds.2013-6972.

Use of PCR-restriction fragment length polymorphism analysis for identification of yeast species isolated from bovine intramammary infection. By Fadda et al., page 7692. A molecular typing method based on PCR-restriction fragment length polymorphism (RFLP) analysis of the 18S–ITS1–5.8S ribosomal DNA region digested with *Hae*III restriction enzyme was used to discriminate yeast strains isolated from bovine milk samples with intramammary infection. Combined phenotypic and molecular approach enabled the identification of yeast species belonging to the genera *Candida*, *Cryptococcus*, *Trichosporon*, *Geotrichum*, and *Rhodotorula*. We have established an RFLP database for yeast species identified in milk samples using the software GelCompar II, which creates an initial method for veterinary yeast identification. Once the database of species has been expanded, rapid and reliable identification of yeast species from milk will be possible.


Quantification of milk yield and composition changes as affected by subclinical mastitis during the current lactation in sheep. By Martí De Olives et al., page 7698. Subclinical mastitis causes great economic losses in ovine dairy livestock because of the reduction of milk yield and alteration of its chemical composition. In this paper, the effect of subclinical mastitis on milk yield and composition has been quantified on a half-udder basis by direct comparison between infected and uninfected glands. Compensation of milk loss in the infected gland by an increase of milk production in the uninfected one has been confirmed. Changes appeared in the very week of infection diagnosis and remained within the current lactation.


Sodium salicylate treatment in early lactation increases whole-lactation milk and milk fat yield in mature dairy cows. By Farney et al., page 7709. To test the effect of inflammatory pathways on programming of lactation, 78 Holstein cows were treated with the antiinflammatory drug sodium salicylate for the first week of lactation, and whole-lactation productivity and retention in the herd were assessed. Treatment with salicylate for this limited time increased whole-lactation milk yield by 21% and milk fat yield by 30% in mature cows. In contrast, primiparous cows tended to have a higher risk of leaving the herd if treated with salicylate. Antiinflammatory treatment in early lactation has dramatic and sustained effects on lactation that vary by parity.

http://dx.doi.org/10.3168/jds.2013-7088.

Comparison of 2 electronic cowside tests to detect subclinical ketosis in dairy cows and the influence of the temperature and type of blood on the test results. By Iwersen et al., page 7719. The diagnostic performance of 2 electronic handheld meters to detect subclinical ketosis in dairy cows was evaluated. Agreement between the 2 devices and a laboratory
We found that when waiting in the holding area before milking and waiting to be released after milking, cows were in a state of stress, indicated by the decrease of the parasympathetic tone. http://dx.doi.org/10.3168/jds.2013-7030.

**Technical note:** Use of laser capture microdissection for the localization of tissue-specific global gene expression in rumen papillae. By Steele et al., page 7748. This study outlines the technique of laser capture microdissection to isolate specific cell types from rumen papillae for gene expression profiling. Biopsied rumen papillae from the ventral sac were laser capture microdissected to isolate connective and epithelial tissue fractions. Then, RNA was isolated from these fractions, global gene expression profiling was conducted using microarrays, and expression signatures were compared using Ingenuity Pathway Analysis. The results indicate that it is possible to isolate tissue-specific fractions and highlight the importance of examining the roles of cell types within rumen tissue when studying the mechanisms of rumen epithelial function. http://dx.doi.org/10.3168/jds.2013-6920.

**Expression of key lipid metabolism genes in adipose tissue is not altered by once-daily milking during a feed restriction of grazing dairy cows.** By Grala et al., page 7753. Dairy cows were offered pasture to standard practice (adequately fed) or restricted to 60% of the standard and milked either once (1×) or twice (2×) daily for 3 wk Milking cows 1× when they were underfed did not alter gene expression in adipose tissue compared with underfeeding alone. Rather, adequately fed cows milked 1× had greater expression of genes involved in fatty acid synthesis and oxidation, and glycerol and triacylglyceride synthesis compared with cows milked 2× or those milked 1× and underfed. http://dx.doi.org/10.3168/jds.2013-6849.

**Effects of roughage source, amount, and particle size on behavior and gastrointestinal health of veal calves.** By Webb et al., page 7765. Developing novel feeding strategies for veal calves to improve welfare requires knowledge of the effects of roughage characteristics on behavior and gastrointestinal health. Supplementing milk replacer with roughage increased ruminination, decreased abnormal behaviors, and reduced ruminal hairball prevalence. More roughage (500 vs. 250 g of dry matter per day) further increased ruminination and decreased abnormal oral behaviors. Abrasive roughages, larger particles, and larger amounts increased abomasal damage. None of the roughage sources used in this study (i.e., straw, maize silage, maize cob silage) improved both behavior and abomasal health compared with only feeding milk replacer. Thus, a combination of sources should be investigated. http://dx.doi.org/10.3168/jds.2012-5135.
Selection of tropical lactic acid bacteria for enhancing the quality of maize silage. By Santos et al., page 7777. The maize plant is the most widely used forage for ensiling; however, maize silage is susceptible to aerobic deterioration and growth of pathogenic microorganisms. The use of specific inoculants for each crop has been recommended for reducing aerobic deterioration after opening the silos. We selected the best tropical lactic acid bacteria (LAB) strains based on their production of metabolites and pH reduction in aqueous extract from maize and ability to inhibit the pathogenic and silage microorganisms in experimental silos. The inhibition of pathogenic and deteriorative microorganisms was not a good parameter for LAB selection. The preselection method based on metabolite production was more efficient in the selection of new inoculant strains and Lactobacillus buchneri strains UFLA SLM11 and SLM103 showed promise to increase silage quality.

Performance and health responses of dairy calves offered different milk replacer allowances. By Bach et al., page 7790. For several decades, milk allotment to calves has been restricted to keep feed and labor costs low and foster solid feed intake and rumen development. More recently, it has been proposed to offer increased amounts of milk (~8 instead of 4 L/d). This study shows that feeding calves 8 L of milk 3 times a day from 12 to 52 d offered no advantage over feeding 6 L of milk also 3 times a day during the same period when all calves were preweaned in groups with 4 L/d from 52 to 59 d, and then 2 L/d from 59 to 73 d. Thus, in this weaning scheme, providing more milk does not ensure greater performance.
http://dx.doi.org/10.3168/jds.2013-6909.

Dairy cows increase ingestive mastication and reduce ruminative chewing when grazing chicory and plantain. By Gregorini et al., page 7798. We tested the hypothesis that cattle grazing chicory or plantain have altered ingestive actions compared with those grazing ryegrass swards. We then assessed the grazing behavior of cows as affected by the proportion of chicory and plantain in the diet. Compared with those grazing ryegrass, cows grazing chicory or plantain masticated more during ingestion and reduced rumination time and chewing. Chicory presented greater constraints to ingestion than plantain. Thus, although chicory is considered to have a greater nutritive value than plantain, its overall feeding value may be no greater than plantain.

Effect of substitution of soybean meal by canola meal or distillers grains in dairy rations on amino acid and glucose availability. By Maxin et al., page 7806. Canola meal and dried distillers grains are frequently used today in North American dairy rations to replace soybean meal. As canola meal has been reported to have a positive effect on milk and milk protein yield compared with soybean meal and dried distillers grains, this study assessed if these positive effects could be explained by increased availability of some amino acids or glucose.

Carbohydrate supplements and their effects on pasture dry matter intake, feeding behavior, and blood factors associated with intake regulation. By Sheahan et al., page 7818. Feeding behavior and blood profiles during the primary a.m. and p.m. feeding bouts were investigated in cows supplemented with a nonforage fiber- or starch-based concentrate. Cows spent more time eating in the a.m.; however, they ate more in the p.m. We observed changes in blood profiles in response to both a.m. and p.m. feeding, but the shape of the profile differed between these times. The starch-based supplement reduced pasture dry matter intake to a greater extent than the nonforage fiber-based supplement. An increase in plasma ghrelin in the p.m., despite the consumption of supplementary feed and the positive energy state remaining from the previous a.m. feeding, indicates a role for environmental factors in regulating feeding behavior in grazing dairy cows.
http://dx.doi.org/10.3168/jds.2013-6981.

Immune and production responses of dairy cows to postruminal supplementation with phytonutrients. By Oh et al., page 7830. The results from this study indicate that phytonutrients, curcuma oleoresin, garlic extract, and capsicum oleoresin, supplied postruminally, have subtle or no effects on blood cells and chemistry, nutrient digestibility, and fecal bacterial diversity, but appeared to have an immune-stimulatory effect in lactating dairy cows.

Peroxisome proliferator-activated receptor-γ stimulates the synthesis of monounsaturated fatty acids in dairy goat mammary epithelial cells via the control of stearoyl-coenzyme A desaturase. By Shi et al., page 7844. Stearoyl-coenzyme A desaturase (SCD) is essential for the biosynthesis of monounsaturated fatty acids (MUFA) in mammary epithelial cells (MEC). Peroxisome proliferator-activated receptor γ (PPARG) isoforms were overexpressed in dairy goat MEC to determine if they altered SCD expression and the synthesis of MUFA. Data indicate a role for PPARG in controlling SCD and MUFA synthesis. This nuclear receptor, a target of nutrients such as
long-chain fatty acids, might be important for regulating the composition of MUFA in ruminant milk. http://dx.doi.org/10.3168/jds.2013-7105.

Expanding the bovine milk proteome through extensive fractionation. By Nissen et al., page 7854. Bovine milk is a source of nutrition for young calves and dairy products made for humans. Milk contains numerous proteins (i.e., its proteome) that can be identified by mass spectrometry-based proteomics. However, the presence of a few dominating protein groups in milk reduces the sensitivity of the proteome analysis. This negative influence can be circumvented by applying fractionation. Several fractionation techniques were evaluated and used to produce a proteome map of raw composite milk from healthy cows in early lactation. The techniques were ranked according to their performance and resulted in a map of 376 proteins and 366 tentative proteins. http://dx.doi.org/10.3168/jds.2013-7106.

Estimation of feed crude protein concentration and rumen degradability by Fourier-transform infrared spectroscopy. By Belanche et al., page 7867. This study examined the potential of Fourier-transform infrared (FTIR) spectroscopy to predict the nutritional value of feeds for ruminants, as an alternative to the in situ technique. The FTIR spectroscopy method was sufficiently sensitive to allow the accurate prediction of feed crude protein concentration by using universal models. However, substantial improvements in the predictions were observed when samples were subdivided in groups. Models for forages led to accurate predictions of crude protein degradation pattern in the rumen. Models for protein-rich concentrates could also be used to classify feeds according to their protein nutritional value. In conclusion, FTIR spectroscopy should be considered as a low-cost alternative in the feed evaluation industry. http://dx.doi.org/10.3168/jds.2013-7127.

Effects of grain, fructose, and histidine feeding on endotoxin and oxidative stress measures in dairy heifers. By Golder et al., page 7881. Thirty heifers were pulse fed grain (1.2% of body weight), to which histidine (6 g) was added, and fructose (0.4% of body weight) was substituted for an equal amount of grain in a partial factorial arrangement. Challenging heifers with an abrupt single exposure to rapidly fermentable carbohydrates did not increase endotoxin and oxidative stress measures. http://dx.doi.org/10.3168/jds.2013-7113.

Effect of essential oils on ruminal fermentation and lactation performance of dairy cows. By Tekippe et al., page 7892. Three experiments with lactating dairy cows were conducted to study the effects of dietary addition of an essential oil product. The essential oils (based on eugenol and cinnamaldehyde) had moderate effects on ruminal fermentation, but tended to increase total-tract digestibility of neutral detergent fiber. Treatment had no effect on milk production or composition. http://dx.doi.org/10.3168/jds.2013-7128.

Passage of stable isotope-labeled grass silage fiber and fiber-bound protein through the gastrointestinal tract of dairy cows. By Warner et al., page 7904. Fractional passage of feed determines the time feed is retained in the digestive tract for microbial degradation and is required to predict nutrient supply to the animal. Usually, external markers such as Cr-neutral detergent fiber (Cr-NDF) are used to estimate passage kinetics of feed particles. This study shows that the stable isotopes $^{13}$C and $^{15}$N can be used as a tool to assess passage kinetics specifically for fiber and fiber-bound nitrogen from grass silage fed to dairy cows. Passage kinetics based on stable isotopes differ from those based on the external marker Cr-NDF. http://dx.doi.org/10.3168/jds.2013-7126.

The effect of changing cow production and fitness traits on net income and greenhouse gas emissions from Australian dairy systems. By Bell et al., page 7918. In this study, an animal and herd model was developed that describes an average dairy herd, Holstein herd and Jersey herd in Australia to assess the effect of changing biological traits on the potential net emissions of greenhouse gases (expressed as carbon dioxide equivalents, CO$_2$-eq.). The sensitivities of farm net income and CO$_2$-eq. emissions per cow and per kilogram of milk solids were assessed by a single unit change in 8 traits (production and fitness traits). We concluded that of the traits studied, increased production efficiencies associated with increased herd survival and reductions in milk volume, liveweight, dry matter intake, somatic cell count, and calving interval would improve net income and reduce emissions per cow and per kilogram of milk solids of Australian dairy systems. http://dx.doi.org/10.3168/jds.2012-6289.

Evaluation of internal reference genes for quantitative expression analysis by real-time reverse transcription-PCR in somatic cells from goat milk. By Modesto et al., page 7932. The use of reference genes is commonly accepted as the most reliable approach to normalize reverse transcription-quantitative PCR data and to reduce possible errors generated in the quantification of gene expression. Here, we validated a set of stably expressed reference genes in caprine milk somatic cells obtained from healthy and infected mammary glands. Our study provides a validated panel of

Reliability of genomic evaluations in Holstein-Friesians using haplotypes based on the Bovine-HD BeadChip. By Schopen and Schrooten, page 7945. In January 2010, the BovineHD Beadchip (~777,000 single nucleotide polymorphisms (SNP), high-density data) from Illumina Inc. (San Diego, CA) became available. Using all 777,000 SNP in a genomic evaluation would enormously increase computing time compared with 50,000 SNP. Elimination of loci that do not give extra information across animals compared with the neighboring loci can reduce the amount of high-density data and consequently save computing time. This study presents a method to eliminate high-density loci based on localized haplotype clusters in a genomic evaluation with a reasonable computing time. In addition, we provide new insight in the effect of using high-density data on the reliability of direct genomic value for Holstein-Friesians. http://dx.doi.org/10.3168/jds.2012-6510.

Factors affecting variation of different measures of cheese yield and milk nutrient recovery from an individual model cheese-manufacturing process. By Cipolat-Gotet et al., page 7952. A high-throughput cheese-manufacturing model was designed to assess milk samples from 1,167 individual Brown Swiss cows. Different measures of cheese yield and milk nutrients recovery and whey losses were defined. The results highlight the importance of herd-test date and the number of days in milk in explaining variations in cheese yield (measured as fresh curd, total solids, or water in the curd as percentage of processed milk or as daily production per cow) and the recovery in curd/loss in whey of milk fat, protein, total solids, and energy. The findings show that cheese yield depends not only on the fat and protein contents of the milk, but also on their proportion retained in the curd or lost in whey and the amount of water retained in the curd. http://dx.doi.org/10.3168/jds.2012-6516.

Genetic parameters of different measures of cheese yield and milk nutrient recovery from an individual model cheese-manufacturing process. By Bittante et al., page 7966. Genetic parameters of cheese yields (fresh curd, solids, and water weight as percentages of processed milk weight) and nutrient recoveries in the curd (fat, protein, total solids, and energy) of bovine milk were estimated. The heritability estimates for the different measures of cheese yields and nutrient recoveries were larger than those obtained for milk yield and fat content, and similar to that of protein content. The heritability of and genetic relationships among the examined traits highlight the existence of important and exploitable genetic variations in cheese yield that do not depend solely upon the fat and protein content of the milk, but also rely heavily on the ability of the coagulum to retain the highest possible proportions of protein, fat, and water. http://dx.doi.org/10.3168/jds.2012-6517.

The use of Fourier-transform infrared spectroscopy to predict cheese yield and nutrient recovery or whey loss traits from unprocessed bovine milk samples. By Ferragina et al., page 7980. Cheese yield and milk nutrient recovery are important technological parameters in the dairy industry. A laboratory cheese-making procedure has previously been proposed for the assessment of these traits at the individual level. However, the large-scale analysis of individual phenotypes is not yet practical because the available techniques are time consuming and we lack automated high-throughput measuring devices. The use of Fourier-transform infrared spectra seems to be a promising technique for predicting cheese yield and milk nutrient recovery traits both in the dairy industry (especially for monitoring cheese-making processes) and for breeding purposes. http://dx.doi.org/10.3168/jds.2013-7036.

Prediction of residual feed intake for first-lactation dairy cows using orthogonal polynomial random regression. By Manafiazar et al., page 7991. Residual feed intake (RFI) is a measure of energy efficiency. The aim of this research was to develop an equation to predict individual RFI of dairy cows in their first lactation. The results could be used in the dairy industry to increase profitability and decrease the carbon footprint by selecting first-lactation cows that are genetically superior in energy efficiency based on the predicted RFI, through indirect or marker-assisted and genomic selection. http://dx.doi.org/10.3168/jds.2013-6560.

Mating programs including genomic relationships and dominance effects. By Sun et al., page 8014. Breed associations, artificial insemination organizations, and on-farm software providers need new computerized mating programs for genomic selection so that genomic inbreeding can be better controlled by comparing genotypes of potential mates. Efficient methods for transferring elements of the genomic relationship matrix from a central database to customers were developed. Mating programs that include genomic relationships were more effective than those using pedigree relationships, and the expected decrease in inbreeding was worth >$3 million annually for US Holsteins. http://dx.doi.org/10.3168/jds.2013-6969.
Copy number variation of *PRAMEY* across breeds and its association with male fertility in Holstein sires. *By Yue et al., page 8024.* This study investigated the copy number variation (CNV) of the bovine *PRAMEY*, a gene family located on the male-specific Y chromosome. The results revealed that the copy number of *PRAMEY* varied significantly within and across 15 cattle breeds investigated. This variation was negatively associated with several male reproductive traits, including testis size, percentage of normal sperm, and nonreturn rate, indicating that the copy number of *PRAMEY* may serve as a valuable marker for sire fertility selection at an early age in cattle. [http://dx.doi.org/10.3168/jds.2013-7037](http://dx.doi.org/10.3168/jds.2013-7037).

Shelf life of pasteurized microfiltered milk containing 2% fat. *By Caplan and Barbano, page 8035.* Our goal was to produce milk containing 2% fat with a refrigerated shelf life of 60 to 90 d using microfiltration plus high-temperature, short-time (HTST) pasteurization in combination with other nonthermal processes. The combined process of microfiltration plus HTST pasteurization (73.8°C, 15 s) used in our study, followed by filling and packaging that is protected from microbial contamination achieved bacteria counts of <20,000 cfu/mL for fluid milk containing 2% fat during 60 to 90 d of storage at both 1.7 and 5.7°C. [http://dx.doi.org/10.3168/jds.2013-6657](http://dx.doi.org/10.3168/jds.2013-6657).

Development of an automatic cow body condition scoring using body shape signature and Fourier descriptors. *By Bercovich et al., page 8047.* This study aimed to develop an automatic tool for scoring body condition. A body condition sensor could help farmers analyze health problems and determine the optimal interval between calving and first insemination in individual cows or feeding strategy at the group level. Results indicate that (1) complete automation of the process with a low-cost digital camera is feasible; and (2) Fourier descriptors of the Euclidean distances from the cow tailhead boundary to the shape center yielded body condition scores with a coefficient of determination ($R^2$) of 0.77. [http://dx.doi.org/10.3168/jds.2013-6568](http://dx.doi.org/10.3168/jds.2013-6568).

Compost bedded pack dairy barn management, performance, and producer satisfaction. *By Black et al., page 8060.* Compost bedded pack (CBP) barn design and maintenance procedures vary considerably, making advising and problem solving challenging. This research focused on management and benefits of the CBP. Daily milk production increased from before to the second year after moving into the CBP barn. Bulk tank somatic cell count decreased from the year before to the year after moving into the CBP. Increasing stirring depth and frequency and warmer ambient weather increased internal CBP temperature. Increased stirring depth, space per cow, and drying rate reduced CBP moisture. Increased internal CBP temperature and warmer ambient temperatures reduced mean herd hygiene scores. [http://dx.doi.org/10.3168/jds.2013-6778](http://dx.doi.org/10.3168/jds.2013-6778).

Reproductive performance of dairy farms in western Buenos Aires province, Argentina. *By Ferreira, page 8075.* Good reproductive performance is essential to ensure profitability of dairy farms. Great variability in reproductive performance among farms and seasonal variations in reproductive performance within farms were observed in dairy farms from Argentina. Efforts should focus on maintaining initial submission (i.e., insemination) and conception rates to enhance reproductive performance. [http://dx.doi.org/10.3168/jds.2013-6910](http://dx.doi.org/10.3168/jds.2013-6910).

Noninferiority trial on the efficacy of premilking teat disinfectant against naturally occurring new intramammary infections using a novel two-step diagnostic process. *By Ceballos-Marquez et al., page 8081.* The efficacy of a premilking teat disinfectant on naturally occurring new intramammary infections was evaluated using a novel two-step diagnostic process. The study was performed in a commercial dairy herd. The trials resulted in a conclusion of noninferiority of an experimental teat disinfectant relative to a positive control. The proposed study design, data analysis, and reporting may serve as a template for a formal efficacy estimation protocol for premilking teat disinfectants. [http://dx.doi.org/10.3168/jds.2013-7108](http://dx.doi.org/10.3168/jds.2013-7108).