Developmental changes in proteins of casein micelles in goat milk using data-independent acquisition-based proteomics methods during the lactation cycle. By Sun et al., page 47. We investigated casein micelle protein components in goat milk identified by data-independent acquisition and data-dependent acquisition-based proteomic approaches during the lactation cycle. Significant differences were identified in the abundance of 115 proteins during the lactation cycle using the data-independent acquisition approach. Protein–protein interaction showed that fibronectin, albumin, and apolipoprotein E had more interactions with other proteins and were considered central nodes. Abundance of growth/differentiation factor 8, peptidoglycan-recognition protein, and 45 kDa calcium-binding protein decreased from 1 to 240 days, whereas that of lecithin cholesterol acyltransferase, folate receptor alpha, and prominin 2 increased from 1 to 240 days. Our results provide a better understanding of the casein micelle proteome during the lactation cycle of dairy goats and indicate those proteins that are important for the development of the mammary gland and newborns.

Prevalence, antimicrobial susceptibility, and antibiotic resistance gene transfer of Bacillus strains isolated from pasteurized milk. By Zhai et al., page 75. It has been reported that Bacillus from pasteurized milk showed resistance to some antibiotics. Bacillus with acquired antibiotic resistance may represent a potential risk for the spread of antibiotic resistance between Bacillus and other clinical pathogens via horizontal gene transfer. Gene tetL encoding tetracycline efflux protein was found to be located on the plasmid pBC46-TL of Bacillus cereus BA117. This plasmid can be transferred into other strains by filter mating. Therefore, the prevalence and antimicrobial susceptibility of Bacillus strains isolated from pasteurized milk should be paid more attention to prevent the spread of antibiotic resistance genes.

Milk metagenomics and cheese-making properties as affected by indoor farming and summer highland grazing. By Secchi et al., page 96. This study addresses the relationships between milk metagenomics, milk composition, and dairy efficiency of 2 groups (6 cows per group) of Brown Swiss cows sampled over 5 months under 2 types of rearing conditions: indoor farming and summer highland grazing. A total of 44 bacterial taxa were obtained in milk, 13 of which are of interest to the dairy industry (lactic acid bacteria and spoilage bacteria) and for human and animal health (other probiotics and pathogenic bacteria). On summer highland pastures, the cows exhibited an increase in almost all the lactic acid bacteria, bifidobacteria, and propionibacteria, and a reduction in spoilage taxa. All bacterial changes disappeared when the cows were moved back indoors from the summer highland pasture.

Manufacture of process cheese products without emulsifying salts using acid curd and micellar casein concentrate. By Hammam et al., page 117. Process cheese (PC) is a dairy food prepared by blending dairy ingredients with nondairy ingredients and then heating with continuous agitation to produce a homogeneous product. Emulsifying salts (ES) have a critical role in PC manufacture, which is calcium sequestration to produce a partially deaggregated casein network, consequently providing the PC with its unique unmelted and melted textural properties. Acid curd and micellar casein concentrate can be used as ingredients to make PC. The results obtained in this study found that PC can be produced with no ES using a 2:1 ratio (on a protein basis) of acid curd to micellar casein concentrate. This ratio produced a partially deaggregated casein network similar to the one in a typical PC using ES. Although there were differences observed in the melted and unmelted texture of PC product made without ES when compared with control, these can be explained due to the possible microstructural interactions induced in the final PC product due to their pH differences.

Responsible antibiotic use labeling and consumers’ willingness to buy and pay for fluid milk. By Schell et al., page 132. A new milk label indicating the responsible (minimized) use, but not the complete elimination, of antibiotics on conventional dairy farms was proposed. We conducted a survey and an experimental auction with real money and real milk to investigate consumers’ preference for a hypothetical responsible antibiotic use–labeled milk. Findings indicate that half of the surveyed consumers would be willing to buy the labeled milk; however, auction participants were not willing to pay a significant premium for it compared with the unlabeled (conventional) milk. The existence of a market for the new label and consumers’ willingness to pay for it require further research.

Prepartum plane of energy intake affects serum biomarkers for inflammation and liver function during the periparturient period. By Janovick et al., page 168. Nonspecific or metabolic
Effects of Saccharomyces cerevisiae boulardii (CNCM I-1079) on feed intake, blood parameters, and production during early lactation. By Hiltz et al., page 187. Active dry yeast supplementation may be beneficial to dairy cows during the lactation transition. This study examined Saccharomyces cerevisiae boulardii (CNCM I-1079) supplementation and its effects on milk production, feed intake, and markers of acute inflammation in dairy cows through the calving transition. Dietary supplementation with Saccharomyces cerevisiae boulardii (CNCM I-1079) improved milk production without increasing feed intake. Acute phase protein serum amyloid A increased with supplementation, implying an increase in acute inflammation after calving. Other markers of inflammation did not increase with supplementation, except TNF-α. Yeast supplementation improved feed efficiency and affected the immune response after calving.
https://doi.org/10.3168/jds.2021-21740.

Impacts of feeding a Saccharomyces cerevisiae fermentation product on productive performance, and metabolic and immunological responses during a feed-restriction challenge of mid-lactation dairy cows. By Marins et al., page 202. Effects of a Saccharomyces cerevisiae fermentation product (NT) on performance, metabolism, inflammation, and immunity during feed restriction in mid-lactation dairy cows were evaluated. Feeding NT did not influence productive performance but improved the granulocyte-killing capacity in cows. Feed restriction did not induce systemic inflammation, and NT did not affect circulating inflammatory cytokines or acute-phase proteins. Results suggested that supplementing NT improved some functions within innate immunity.
https://doi.org/10.3168/jds.2022-22522.

Effects of combined addition of 3-nitrooxypropanol and vitamin B₁₂ on methane and propionate production in dairy cows by in vitro-simulated fermentation. By Liu et al., page 219. The problem of global warming and the greenhouse effect is growing, and greenhouse gas abatement is highly regarded by the international community. Methane produced by ruminants during digestion not only aggravates the greenhouse effect but also causes a waste of feed energy. 3-Nitrooxypropanol reduces methane emission in dairy cows but increases hydrogen production as well. However, in this in vitro study, the combination of 3-nitrooxypropanol and vitamin B₁₂ not only reduced methane production but also increased propionate production, which could contribute to mitigating greenhouse gas emissions and improving feed efficiency in ruminants.
https://doi.org/10.3168/jds.2022-22207.

Dietary replacement of soybean meal with heat-treated soybean meal or high-protein corn distillers grains on nutrient digestibility and milk composition in mid-lactation cows. By Chesini et al., page 233. We evaluated the effects of increased rumen undegradable protein on performance of dairy cows by including heat-treated soybean meal (HTSBM) or high-protein (crude protein = 44.9%) corn dried distillers grains with solubles (FP) in diets. We determined whether responses were dependent on the digestible amino acid profile. Both HTSBM and FP increased nutrient intake and milk yield compared with the control group. Increased dietary rumen undegradable protein improved performance of cows, but no differences in milk protein yield were observed between HTSBM and FP treatments.
https://doi.org/10.3168/jds.2022-21904.

Susceptibility to milk fat depression in dairy sheep and goats: Individual variation in ruminal fermentation and biohydrogenation. By Del-la Badia et al., page 245. Certain diets are known to inhibit milk fat synthesis below the expected potential of the animal, causing milk fat depression syndrome and, consequently, economic losses. This syndrome has been attributed to the effect of antilipogenic metabolites derived from diet-induced alterations in ruminal function. However, it is not yet known whether some conditions may predetermine the individual variations in milk fat depression extent or whether its severity depends only on the individual response to the diet. Based on a direct comparison between sheep and goats, we suggest that susceptibility to fish oil-induced milk fat depression depends primarily on the individual differences in the ruminal disappearance of
The better carcass performance of crossbred cows and had a higher total value (€109 more per cow). Formation and condition scores, fetched higher prices, and carcasses from crossbreds were heavier, had better con- 

Holstein and crossbred cows and found that the carcasses of crossbreds had a higher total value (€109 more per cow). 

The numerous significant genomic regions identified across studies was low. Most annotated genes were associated with somatic cell count-related traits and the Holstein breed. Prioritization analysis resulted in 427 genes, with most of the top-ranked genes from the cytokine superfamily, whereas prioritized genes were mainly associated with immune response. In conclusion, this study identified interesting key functional candidate genes for resistance to bovine mastitis. https://doi.org/10.3168/jds.2022-21923.

Effects of sustainable agronomic intensification in a forage production system of perennial grass and silage corn on nutritive value and predicted milk production of dairy cattle. By Koenig et al., page 274. We investigated the sustainable intensification of agronomic practices in a dual forage system of perennial grass and silage corn on forage quality and predicted milk yield and nitrogen utilization of dairy cattle. Improved manure management increased protein content of the forages and could allow for reduced importation of feed nitrogen to the farm. Decreasing the number of cuts of grass to increase yield reduced fiber digestibility, but when combined with silage corn and a relay crop and with improved feed formulation models, milk yield was maintained or improved, and nitrogen excretion was reduced, potentially lessening the impact on the environment. 

https://doi.org/10.3168/jds.2022-22110.

Estimation of genetic parameters and single-step genome-wide association studies for milk urea nitrogen in Holstein cattle. By Ma et al., page 352. The large amount of nitrogen released by the dairy cattle industry is a major cause of environmental problems. Furthermore, high milk urea nitrogen levels indirectly reflect the inefficiency of nitrogen utilization by the animals. As an indicator that can be measured in many individuals, milk urea nitrogen is a promising trait for genetic selection. Based on our findings, milk urea nitrogen has been shown to be a heritable trait with low heritability, indicating that genetic progress for milk urea nitrogen can be achieved through direct genetic or genomic selection. The numerous significant genomic regions identified suggest that milk urea nitrogen is a highly polygenic trait. In summary, genetic selection for improved nitrogen utilization has great potential to positively affect the dairy cattle industry. 

https://doi.org/10.3168/jds.2022-21857.

A survey of practices and attitudes around cull cow management by bovine veterinarians in Ontario, Canada. By Marshall et al., page 302. Veterinarians are trusted sources of information for dairy farmers. The removal of cows from dairy herds is referred to as culling, and the management of these animals has been a source of regulatory changes by government and industry organizations. The practices recommended for the management of cull cows by veterinarians are important to those making management decisions on dairy farms. Even though most dairy veterinarians believe cull cow welfare has improved recently, most would like to be more involved in culling decisions. Veterinarians’ knowledge of and attitudes toward cull cow management are important for improving welfare outcomes for culls. 

https://doi.org/10.3168/jds.2022-22005.

Cull cow carcass traits and risk of culling of Holstein cows and 3-breed rotational crossbred cows from Viking Red, Montbéliarde, and Holstein bulls. By Piazza et al., page 312. Culled dairy cows represent a significant source of beef production, but the quality of their carcasses may vary due to the wide variability in age, stage of lactation, breed, and body condition of the cows at slaughter. This study compared the performance at slaughter of purebred Holstein and crossbred cows and found that the carcasses from crossbreds were heavier, had better conformation and condition scores, fetched higher prices, and had a higher total value (€109 more per cow). The better carcass performance of crossbred cows should be considered when evaluating the economic efficacy of crossbreeding schemes. 

https://doi.org/10.3168/jds.2022-22328.

Estimation of genetic parameters and individual and maternal breed, heterosis, and recombination loss effects for production and fertility traits of spring-calved cows milked once daily or twice daily in New Zealand. By Jayawardana et al., page 364. Genetic parameters and individual and maternal breed, heterosis, and recombination loss effects for production and fertility of seasonally calved New Zealand dairy cows milked once daily and twice daily were investigated. Heritability and repeatability estimates for production and fertility
traits were consistent across both milking frequencies. In both milking populations, Holstein Friesian cows produced greater milk yields than Jersey cows; however, maternal breed effects for yields favor Jersey cows. Fertility outcomes were better with Jersey cows than with Holstein Friesian cows. Favorable individual heterosis effects were identified for production and fertility traits in both milking populations and were consistent across milking frequencies. https://doi.org/10.3168/jds.2022-22053.

Association between body condition genomic values and feed intake, milk production, and body weight in French Holstein cows. By Lefebvre et al., page 381. This study analyzed the relationship between direct genomic values (DGV) for body condition score (BCS) and phenotypes for BCS, feed intake, milk yield and composition, and body weight in French Holstein cows. Body condition score was affected by BCS DGV but with an increasing effect during the lactation, showing that it could also predict body mobilization. Cows with low BCS DGV produced slightly more milk than expected and, more importantly, increased their feed intake less rapidly in the beginning of the lactation. https://doi.org/10.3168/jds.2022-22194.

Synchronization of breeding and its impact on genetic parameters and evaluation of female fertility traits. By Haile-Mariam et al., page 392. Synchronization of breeding is a routine practice in some dairy herds owing to challenges with estrus detection. However, failing to account for synchronization may affect genetic evaluation for fertility traits. This study assessed the effect of synchronization on genetic parameters and evaluation of female fertility traits. Using breeding data from synchronized cows makes traits such as calving to first service ineffective in evaluations, whereas the effect on traits associated with outcomes of inseminations (e.g., calving interval) is minor. Excluding data from synchronized cows on calving to first service can reduce the effect of synchronization on the genetic evaluation of fertility. https://doi.org/10.3168/jds.2022-22232.

Identification of genomic regions associated with total and progressive sperm motility in Italian Holstein bulls. By Ramirez-Diaz et al., page 407. Genome-wide association studies provide an approach to elucidating the genetic control on reproductive traits and some understanding of its genetic architecture. A genome-wide association study was carried out using single nucleotide polymorphisms and phenotype measurements to identify genomic regions associated with variation of total and progressive sperm motility. In our research, 2 genes involved in sperm metabolism (E1BHJ0) and cell motility (DOCK1) were identified in the 2 regions with the highest proportion of genetic variance for both traits. Other genes identified were related to spermatogenesis (peptidylarginine deiminases, FLOT1, PPP1R10, PPP1R11, and PPP2R2C), fertility (peptidylarginine deiminases), and immune response (IL17A). https://doi.org/10.3168/jds.2021-21700.

Genetic analysis of production traits and body size measurements and their relationships with metabolic diseases in German Holstein cattle. By Schmidtmann et al., page 421. This study provides genomicheritabilities for production, body size-related traits, and metabolic diseases in Holstein Friesian cattle. In addition, we estimated genetic correlations among all traits and performed genome-wide association studies to gain detailed insights into the genetic architecture of traits. We demonstrated that production is genetically antagonistically correlated with the occurrence of metabolic diseases. Furthermore, our results showed that larger and sharper animals tend to be more affected by metabolic disorders, possibly owing to their higher production ability. Overall, this knowledge is helpful for improving selection decisions in dairy cattle breeding programs. https://doi.org/10.3168/jds.2022-22363.

Detailed analysis of mortality rates in the female progeny of 1,001 Holstein bulls allows the discovery of new dominant genetic defects. By Besnard et al., page 439. In this article, we computed within-family juvenile mortality rates at 5 stages before 1 year of age for the female progeny of 1,001 Holstein bulls. We performed a battery of analyses on the progeny of 2 of the worst sires to determine the molecular etiology of this increased mortality. We identified a de novo missense mutation of GATA6 and a rearrangement between chromosomes 26 and 29, and described their clinical consequences. Monitoring of within-family juvenile mortality is an efficient tool to detect dominant genetic defects that might have been overlooked. https://doi.org/10.3168/jds.2022-22365.

The effect of antibiotic versus no treatment at dry-off on udder health and milk yield in subsequent lactation: A retrospective analysis of Austrian health recording data from dairy herds. By Sigmund et al., page 452. For decades, the prophylactic use of antimicrobials at dry-off was an accepted and frequently used tool in dry cow management strategies. The aim of this study was to determine the effects of antibiotic dry cow therapy versus no treatment on udder health and performance. Our results indicated that the positive effect on milk yield
of treating cows with antibiotics at dry-off depends on their intramammary infection status. https://doi.org/10.3168/jds.2022-21790.

**Increased parity is negatively associated with survival and reproduction in different production systems.** By Lean et al., page 476. Increased parity is negatively associated with survival and reproduction in different production systems. Using data from several large studies, we found that the hazard of removal, death, and sale increased with parity. The hazard of not being bred increased with parity, and the hazard of pregnancy and odds of pregnancy in a lactation declined with increased parity. Milk, milk fat, protein, and solids yield accounted for some of the difference in reduced reproductive performance. Milk, milk protein percentage, and yields of protein or fat were associated with reproductive performance as a linear and quadratic response. Associations of parity with production system or milk and constituent yield were much less evident for pregnancy at first insemination. https://doi.org/10.3168/jds.2021-21672.

**Associations of parity with health disorders and blood metabolite concentrations in Holstein cows in different production systems.** By Lean et al., page 500. This retrospective study evaluated the lactational incidence of diseases. The incidence of clinical hypocalcemia, lameness, retained placenta, and ketosis increased markedly with parity. Cows in parity 1 had greater odds of dystocia, metritis, and endometritis than cows of higher parity. Parity 1 and parity ≥5 cows differed in concentrations of blood glucose, nonesterified fatty acids, β-hydroxybutyrate, blood urea nitrogen, and total protein. Calcium and phosphorus homeostasis were also impaired in cows of higher parity. https://doi.org/10.3168/jds.2021-21673.

**Voluntary heat stress abatement system for dairy cows: Does it mitigate the effects of heat stress on physiology and behavior?** By Grinter et al., page 519. The objective of this study was to evaluate the effects of 2 heat abatement strategies using a motion-activated, voluntary soaking system for dairy cows, with or without mandatory soakings at the exit of the milking parlor. No major differences in respiration rate, feeding behavior, or milk production were observed between treatments. Voluntary soaker use was associated positively with temperature-humidity index. We found that voluntary soaker use is highly variable among cows. https://doi.org/10.3168/jds.2022-21802.

**Trust, agreements, and occasional breakdowns: Veterinarians’ perspectives on farmer-veterinarian relationships and use of antimicrobials for Swedish dairy cattle.** By Gröndal et al., page 534. This study explores Swedish dairy cattle veterinarians’ perspectives on how farmer-veterinarian relationships interact with antimicrobial prescribing. Data consisted of semistructured interviews with 21 veterinarians. The study shows that veterinarians value their relationships with farmers and that they put effort into maintaining these relationships. The veterinarians generally describe well-established relationships with the farmers as facilitative of restrictive antimicrobial use. The study supports the idea that antimicrobial use for dairy cattle takes shape in relationships in which both veterinarians and farmers take an active part. Thus, it cannot be reduced to the behavior of individual veterinarians. This has to be accounted for when creating policies for the prudent use of antimicrobials. https://doi.org/10.3168/jds.2022-21834.

**Contextualized understandings of dairy farmers’ perspectives on antimicrobial use and regulation in Alberta, Canada.** By Ida et al., page 547. Ethnographic fieldwork was conducted to investigate dairy farmers’ perspectives regarding antimicrobial use in Alberta, Canada. The findings, based on an analysis of 25 semistructured interviews and participant and direct observation, reveal many dairy farmers in this sample: (1) hope to maintain agency regarding antimicrobial use; (2) feel certain antimicrobial use policies implemented in other contexts would be impractical in Alberta; (3) worry that antimicrobial use policy will be based on misguided consumer concerns; and (4) are variably skeptical of the link between antimicrobial use in dairy cattle and antimicrobial resistance in humans due to their strict adherence to milk safety protocols. https://doi.org/10.3168/jds.2021-21521.
Economic losses associated with mastitis due to bovine leukemia virus infection. By Nakada et al., page 576. Bovine leukemia virus is endemic on Japanese dairy farms. A survival analysis was conducted to estimate the hazard ratio of subclinical mastitis associated with bovine leukemia virus infection using data from 9 Japanese dairy farms. The hazard ratio of mastitis for cows with a high proviral load was 2.61 times higher than that of noninfected cows. The economic loss due to mastitis per high-proviral-load cow was $418.59, and the annual economic loss in Hokkaido Prefecture due to mastitis caused by bovine leukemia virus infection was estimated at $6,097,225. https://doi.org/10.3168/jds.2021-21722.

Pathogenic infection characteristics and risk factors for bovine respiratory disease complex based on the detection of lung pathogens in dead cattle in Northeast China. By Zhou et al., page 589. This study found that bacterial, viral, or mycoplasma co-infection is the main feature of bovine respiratory disease complex, and synergistic infections exist among pathogens. Novel pathogens bovine herpesvirus-1.2c, bovine respiratory syncytial virus gene subgroups IX, and Pasteurella multocida serotype D, and major pathogens causing bovine suppurative or caseous necrotizing pneumonia were identified for the first time. These epidemiological data will be helpful in formulating strategies of control and prevention, developing new vaccines, improving clinical differential diagnosis by necropsy, predicting the most likely pathogen, and justifying antimicrobial use. https://doi.org/10.3168/jds.2022-1929.

Intrauterine infusion of a pathogenic bacterial cocktail is associated with the development of clinical metritis in postpartum multiparous Holstein cows. By Silva et al., page 607. We developed a novel in vivo model of clinical metritis in postpartum multiparous cows using intrauterine inoculations with a bacterial cocktail containing either $10^6$ cfu (low dose) or $10^9$ cfu (high dose) of Escherichia coli, Trueperella pyogenes, and Fusobacterium necrophorum. Challenged cows were compared with cows infused with sterile saline solution (controls). The model was successfully associated with metritis in 83% of cows receiving the lower dose ($10^6$ cfu) of bacteria. The low-dose group also presented an increase in rectal temperature and a decrease in dry matter intake during the follow-up period. Interestingly, the group receiving the higher dose ($10^9$ cfu) of the bacterial cocktail was more similar to the control group, suggesting that the total bacterial load used for the challenge may affect metritis incidence in a nonlinear manner. https://doi.org/10.3168/jds.2022-21954.

The effects of dexamethasone administration on physiological, behavioral, and production parameters in dairy cows after a difficult calving. By Swartz et al., page 653. Dexamethasone or saline (control) was given within 12 hours following a difficult calving in Holstein cows. An inflammatory marker (haptoglobin), blood β-hydroxybutyrate concentrations, body temperature, and behavior were measured within the first 7 days postpartum, and production was measured for 120 days. Primiparous cows that received dexamethasone had greater haptoglobin concentrations than primiparous control cows. Behavioral responses were also different between treatment groups, potentially indicating the mitigation of discomfort following dexamethasone treatment. Cows treated with dexamethasone produced less milk in the first month of lactation. https://doi.org/10.3168/jds.2022-22029.

Assessing optimal frequency for image acquisition in computer vision systems developed to monitor feeding behavior of group-housed Holstein heifers. By Bresolin et al., page 664. Precision livestock technologies, such as wearable sensors, have been proposed as an alternative to collect difficult-to-measure phenotypes in cattle. Wearable sensors, however, are usually phenotype-specific and require 1 device per animal. Conversely, computer vision systems have become a potential technology for collecting individual feeding behavior data, as few devices can monitor a group of several animals, and the images collected are not limited to a specific phenotype. In this context, we developed a computer vision system to individually monitor detailed feeding behaviors of group-housed dairy heifers. In addition, we investigated the optimal frequency of image acquisition to perform inference with minimal effect on the feeding behavior prediction quality. https://doi.org/10.3168/jds.2022-22138.

Diagnostic milk biomarkers for predicting the metabolic health status of dairy cattle during early lactation. By Heirbaut et al., page 690. The transition period is a challenging period for high-producing dairy cattle. Cows in early lactation are highly at risk to develop subclinical metabolic problems, particularly during the first 3 weeks of lactation. Therefore, early prediction of metabolic status is crucial in order to precisely diagnose metabolic disease. In this study, 117 lactations from 99 multiparous cows were intensively monitored by taking repeated blood (day 3, 6, 9, 21) and milk samples (day 3 to 23) during the first 3 weeks of lactation. The results show...
that models using milk composition, including beta-hydroxybutyrate and milk fatty acids determined by mid-infrared, can accurately predict metabolic status during this period. 
https://doi.org/10.3168/jds.2022-22217.

A survey of male and female dairy calf care practices and opportunities for change. By Wilson et al., page 703. This study explored feeding practices for male and female dairy calves with the goal of describing potential differences. We found that most feeding practices were similar between male and female calves, but male calves were fed less milk and were more likely to be fed waste milk. Female farmers and those who kept male calves on their farm longer than 1 week of age were more likely to use better management practices for male calves. Farmers reported that practices that promote calf health and welfare were important to them, and they valued the guidance of their herd veterinarian.
https://doi.org/10.3168/jds.2022-22238.

Changes in biomarkers of metabolic stress during late gestation of dairy cows associated with colostrum volume and immunoglobulin content. By Rossi et al., page 718. We investigated associations between metabolic stress during the last 6 weeks of gestation and the volume and immunoglobulin content of the colostrum produced. We observed that cows producing more than 6 L of colostrum exhibited increased metabolic activity during late gestation. Also, a greater blood antioxidant activity throughout late gestation was observed in cows with higher yields of colostrum, suggesting that greater availability of antioxidants might support the production of higher volumes of colostrum. Therefore, further studies should evaluate whether supplementation with additional antioxidants during late gestation can improve colostrum yield.
https://doi.org/10.3168/jds.2022-22240.

The in vitro effect of lactose on Clostridium perfringens alpha toxin production and the implications of lactose consumption for in vivo anti-alpha toxin antibody production. By Derix et al., page 733. Necro-hemorrhagic enteritis causes sudden death in milk-fed veal calves of usually 4 to 8 months of age, which results in high financial losses. Dietary factors may play a role in the development of immunity against Clostridium perfringens, in particular alpha toxin, an essential virulence factor in pathogenesis. We observed a concentration-dependent inhibition of lactose on in vitro alpha toxin production and subsequently proved in a randomized clinical trial that lactose consumption impaired the animal’s antibody production against alpha toxin. Therefore, a low-lactose or even lactose-free diet may be a preventive factor for necro-hemorrhagic enteritis in calves. 
https://doi.org/10.3168/jds.2022-22467.

Evaluation of potential biomarkers to determine adequate colostrum provision in male dairy-beef calves upon arrival at the rearing facility beyond 14 days of age. By Pisoni et al., page 743. Lack of proper amount and quality administration of colostrum in male calves is a well-known yet unsolved problem in the dairy-beef industry. Colostrum consumption provides immunity and exerts morphological and functional changes through the ingestion of immunoglobulins and bioactive compounds. To date, no standardized methodology exists to assess colostrum provision in calves older than 14 days of age at arrival to rearing facilities. This study investigates potential biomarkers of colostrum provision in unweaned calves. Results showed that measurements of total protein and gamma-glutamyl transferase are reliable indicators of colostrum provision in calves beyond 14 days of age.
https://doi.org/10.3168/jds.2022-22233.

Effect of dose and frequency of prostaglandin F₂α treatments during a 7-day Ovsynch protocol with an intravaginal progesterone releasing device on luteal regression and pregnancy outcomes in lactating Holstein cows. By Hölder et al., page 755. The objective of this study was to compare the effect of 2 prostaglandin F₂α (PGF₂α) treatments 24 hours apart (25 mg of dinoprost), and the treatment of a double PGF₂α dose (50 mg of dinoprost) with a control group (25 mg of dinoprost at day 7) during a 7 day Ovsynch protocol with inclusion of a progesterone releasing intravaginal device on luteal regression, and pregnancy per artificial insemination in lactating Holstein cows. Two consecutive dinoprost treatments decreased progesterone levels near timed artificial insemination, and doubling the dose of dinoprost tended to decrease progesterone near timed artificial insemination. Cows that received 2 PGF₂α treatments 24 hours apart had a greater pregnancy rate per artificial insemination compared with cows treated with a double dose of PGF₂α.
https://doi.org/10.3168/jds.2022-22245.

ZFP57 regulates DNA methylation of imprinted genes to facilitate embryonic development of somatic cell nuclear transfer embryos in Holstein cows. By Yu et al., page 769. This study showed that overexpressing the zinc-finger protein ZFP57 in donor cells significantly enhanced the efficiency of bovine somatic cell nuclear transfer by maintaining the methylation of a set of imprinted genes during early embryonic development. More
importantly, ZFP57 overexpression increased total cell number, the number of trophectoderm cells, and the ratio of inner cell mass to total cells in somatic cell nuclear transfer blastocysts, reduced the apoptotic rate, and enhanced the early development of Holstein cow clone embryos. This study provides a strategy for improving the efficiency of somatic cell nuclear transfer that would benefit the breeding of Holstein cows. https://doi.org/10.3168/jds.2022-22427.

**Mechanism underlying the modulation of milk production by incomplete milking.** By Deacon et al., page 783. Milk secretion can be modulated by both systemic and local factors. Incomplete milking can reduce milk secretion in 1 quarter without affecting secretion in other quarters, but the mechanism by which this occurs is unknown. To explore this mechanism, cows were milked completely in 1 half-udder, whereas the other half-udder was milked incompletely for 4 weeks. The results show that incomplete milking reduces secretory activity and the number of mammary epithelial cells, with prolactin signaling also contributing to a limited extent. https://doi.org/10.3168/jds.2022-22164.

**Comparative analysis of changes in whey proteins of goat milk throughout the lactation cycle using quantitative proteomics.** By Sun et al., page 792. We investigated the whey proteome of goat milk at 1, 3, 30, 90, 150, and 240 days after delivery using data-independent acquisition and data-dependent acquisition quantitative proteomic approaches. Clustering and principal component analyses revealed that the protein components of goat milk are associated with specific lactation stages. Protein–protein interaction showed that fibronectin has more interaction with other proteins and was thus considered as a central node. Our results provide a better understanding of the whey proteome during the lactation cycle of dairy goats and indicate that changed proteins are important for a better understanding of the intrinsic physiological function of goats. https://doi.org/10.3168/jds.2022-21800.