



Journal of Dairy Science® Scientific Sections¹

The Journal of Dairy Science® publishes original research, invited review articles, and other scholarly work that relates to the production and processing of milk or milk products intended for human consumption. The journal is broadly divided into dairy foods and dairy production sections.

DAIRY FOODS SECTIONS

Manuscripts should be submitted to the section that is the primary focus of the study. For example, probiotic studies that address survival in the food product should go in Microbiology and Safety; probiotic studies that address product quality should go in Sensory Analysis; and probiotic studies that are focused on bioactivity or health should go in Bioactivity and Human Health.

Bioactivity and Human Health

All manuscripts should have a dairy focus. We are especially interested in

- Studies on macromolecules (enzymes, carbohydrates, proteins, etc.) such as their structure and function, in a dairy context or application.
- Probiotic studies that directly include dairy such as the use of a dairy matrix to deliver the probiotics.
- Biological functionality of components specific to dairy matrices (minerals, bioactive peptides, etc.).

Chemistry and Materials Science

- Original research that improves our understanding of the chemical and physical properties of milk, milk components and dairy foods.
- Chemical reactions and interactions of milk and milk components that influence the quality and shelf-life of dairy foods and ingredients.
- Innovations in analytical techniques for the characterization of the chemical and physical properties of milk, milk components and dairy foods.
- Detection of compounds in milk and milk product and their relation to food quality, food functionality, food safety, and nutrition.

- Lipids—biochemical analysis of milkfat structure and/or function; specific property characterization, lipid composition studies.
- Proteins—macromolecular characterization of milk product casein(s), whey proteins, and/or enzyme structure/function investigations.
- Lactose, vitamins, and minerals—studies involving one or more aspects of these components in dairy products, especially in the context of biochemical characterization and novel composition analyses.
- Structural studies—research emphasizing micro- or nanostructural characterization of components in dairy foods, including chemical bonding, stability, crystallographic studies, or synthesis investigations, including the use of emerging technology applications in dairy materials science.

Dairy Product Microbiology and Safety

All manuscripts should have a dairy focus or connection to warrant inclusion in JDS. We are especially interested in

- Pathogens—improved detection methods, genotyping, screening, and related studies of microorganisms that impact dairy food safety and/or quality; development of improved methods for screening dairy products to ensure safety/hygiene monitoring;
- Lactic acid bacteria (LAB) and other key industrial dairy species—biochemistry, physiology, and their occurrence or application in products in the context of dairy fermentation and quality;
- Spoilage—improved identification and prevention of spoilage microorganisms for dairy products;
- Microbial ecology—impact of microbes on dairy food quality and safety; impact of various practices (cow bedding, cow feed, milking equipment, etc.) on the microbial ecology, safety and quality of dairy products.

Food Systems and Environment

- Carbon footprint of dairy foods production.
- Energy use/optimization of dairy processing.
- Environmental impact of dairy processing.
- Environmentally conscious packaging.

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- Food additives and the environment.
- Improved applications/valorization of coproducts (acid whey, sweet whey, etc.).
- Manufacturing wastewater treatment.

Processing and Engineering

- Original research that improves our understanding of the basic principles and practice of process engineering, process control, and technology as it relates to existing and novel dairy processes for milk, dairy ingredients, and dairy foods.
- Studies on heat, mass transfer phenomena, energy utilization, and related properties relevant to the unit operations to convert milk and other dairy systems into value added foods and ingredients.
- Innovative discoveries in technology and their application to milk and dairy foods.
 - Processing effects—effect of processing upon denaturation, aggregation, and destabilization of milk proteins or other macromolecules in fluid or dry dairy foods.
 - Formulation—studies on the development of novel dairy foods or ingredients, including processing techniques which quantify stability, functionality, and bioavailability.
 - Optimization studies—dairy processing and engineering investigations that demonstrate improved suitability and efficiency of manufacturing regimens, and extend shelf-life, and/or consumer sensory properties of existing dairy products.

Sensory Analysis

- Human sensory evaluation (consumer and/or trained and/or sensory-directed instrumental techniques) of dairy ingredients and/or dairy foods must be central to the work.
- Descriptive analysis, including lexicon development, of dairy ingredient and/or product quality.
- Evaluation of animal management, milk composition, etc. upon milk and/or dairy product quality.
- Milk processing, storage, shelf-life studies with dairy ingredients and/or products.
- Dairy product and ingredient quality and functionality evaluation (consumer, trained, instrumental).
- Consumer perceptions and behavior with dairy foods.

DAIRY PRODUCTION SECTIONS

Animal Nutrition

- Nutrients (structural and nonstructural carbohydrates, protein and amino acids, fats, macro- and micro-minerals, vitamins, and water).
- Feeds and feeding (forages, including grazing, harvesting and feeding management related to nutrition; supplemental fats influencing nutrition and milk composition; co- and by-product feeds; rumen-protected products related to nutrition and milk composition; feed intake and feed efficiency).
- Rumen and gastrointestinal tract (physiology and microbiology of the rumen and gastrointestinal tract; microbial protein synthesis; rumen microbiome; probiotics).
- Metabolism as it relates specifically to feeding and nutrition.
- Calf and replacement heifer nutrition (including colostrum and milk replacers).

*Note: colostrum feeding as it relates to the health of the calf should be submitted to **Health, Behavior, and Well-being**.*

Farm Systems and Environment

- Dairy production systems and management, including animal replacement and breeding decisions.
- Housing and stall design for calves, heifers, and mature cows.
- Pasture management and grazing design (where the outcome is growth and productivity of the animal).
- Milking systems (including robotics).
- Mathematical modeling of dairy farm systems.
- Precision management tools and whole-herd monitoring systems.
- Decision-support systems (decision-trees, mathematical programming, and statistical process control).
- Financial analysis of dairy practices and dairy production systems.
- Human resource management.
- Consumer perceptions of dairy production practices and systems
- Manure (nutrient and resource management).
- Water and water quality (phosphorus, nitrogen, and carbon).
- Greenhouse gases, including carbon dioxide and methane.

Notes: Papers specifically addressing rumen microbiology or physiology leading to the production

of greenhouse gases by the cow should be submitted to **Animal Nutrition**.

- Life cycle analysis as it relates to dairy cow production systems.
- Sustainability methods for dairy production and processing, including waste streams and effluent from dairy processing facilities.

Genetics and Genomics

- Animal breeding (within the context of animal genetics)
- Note: papers that where “breeding” refers to insemination should be submitted to Physiology; papers that use genomic technologies for the purpose of specifically studying physiology, endocrinology, or other aspects of animal or microbial biology should be submitted to **Physiology, Animal Nutrition, or Health, Behavior, and Well-being**.
- Genetic improvement, including genomics and genomic selection.
- Models and genetic evaluations, including trait evaluations and breeding values for new traits.
- New computational methodology.

Health, Behavior, and Well-being

This section is for papers that address

- Mechanisms and risk factors for infectious or metabolic disease; disease diagnosis, prevention and treatment
- Mammary health and mastitis, including milk quality and milk microbiology
- Immunology, including vaccines and vaccination programs; immune function and inflammation as they relate to health
- Injuries and lesions
- Pain assessment and clinical scoring systems
- Animal behavior
- Animal welfare and well-being, including mechanisms and effects of animal stress
- Health, behavior, and well-being of male dairy calves that meaningfully relates to the dairy industry

All manuscripts should be relevant to a broad, international readership. We do not normally publish clinical case studies, case series or papers with a narrow veterinary clinical interest.

Physiology

- Growth and Development—endocrinology and biology of the embryo, fetus, calf, heifer, and cow as it relates to growth and development, including

mammary growth and development, to a mature size; physiology and endocrinology of appetite regulation and feed intake; aging of the adult animal.

- Reproduction—reproductive endocrinology and biology of the male and female; gamete biology (sperm and ova); cryopreservation of gametes; artificial insemination; estrus and estrous detection systems; assisted reproductive technologies including cloning, genetic modification, and superovulation; timed artificial insemination programs (estrous synchronization and resynchronization of non-pregnant cows); embryology; pregnancy diagnosis; embryonic loss; methods to increase fertility; and natural mating (bull breeding).
- Lactation—endocrinology and biology of milk production and lactation, including whole-animal metabolism and mammary cell physiology; chemical analysis of milk (e.g., spectroscopy, proteomics) for the purpose of inferring metabolism or physiology of the cow; milking frequency as it relates to physiology and reproduction.
- Environmental physiology—endocrinology and thermobiology of heat- and cold-stress; non-thermal environmental stressors, including environmental toxins that affect physiology, endocrinology, growth, reproduction, and lactation.
- Studies utilizing cell culture techniques are invited, but must satisfy two or more of the following criteria: (1) cell culture findings are supported by whole-animal experimental data; (2) images of cells are provided with appropriate immunostaining to confirm the cell type; (3) mRNA data is supported by protein analysis; (4) data derived from cell culture must use two different cell sources (e.g., primary and transformed from same species, or two cell lines from different species). For primary cell data, the origin of the cells must be clearly described.