

# WESTERN DAIRY CENTER

Utah State University (Logan)  
[www.usu.edu/westcent](http://www.usu.edu/westcent)



## CENTER DIRECTOR

Donald J. McMahon, PH.D.  
Center Director  
435-797-3644  
[donald.mcmahon@usu.edu](mailto:donald.mcmahon@usu.edu)

## OVERVIEW

The Western Dairy Center's primary location is Utah State University in Logan, with additional resources available at other universities in the Intermountain West. The faculty has extensive expertise in dairy processing/production, microbiology, chemistry and sensory analysis. An integral part of the center is a newly established Dairy Technology Innovation Laboratory group of researchers dedicated to providing innovative solutions to challenges and opportunities facing today's dairy processing industry.

## RESEARCH FOCUS

- Cheese flavor and functionality
- Fermented products, including cheese and yogurt
- Ultra-high-temperature and extended-shelf-life fluid milk beverages
- Milk protein chemistry, including coagulation, denaturation and separation
- Milk fractionation and use of membrane separation in dairy foods
- Anaerobic digestion of dairy processing waste
- Whey protein extrusion
- Application of genetics, genomics and metabolomics to lactic acid bacteria
- Whey and milk utilization

## FACILITIES AND EQUIPMENT

The Gary Haight Richardson Dairy Products Laboratory at Utah State University is a complete dairy processing facility. It operates daily to produce the dairy products used on campus. It also is used extensively by the researchers at the Western Dairy Center, as well as by researchers from industry for research and product development. Facilities are available on a daily basis for research, product development, formulation, manufacture and scale-up of dairy products. The efficient operation and flexible scheduling ensure a short turnaround time for the customers' products.

### TO ARRANGE USE OF THE PILOT PLANT FACILITY, CONTACT:

**CONTACT: RANDALL BAGLEY**  
 Manager, Gary Haight Richardson  
 Dairy Products Laboratory  
 435-797-2108  
 randall.bagley@usu.edu

### TO ARRANGE RESEARCH TRIALS, CONTACT:

**CONTACT: CARL BROTHERSEN, M.S.**  
 Associate Director, Dairy  
 Technology Innovation Laboratory  
 435-797-3466  
 carl.brothersen@usu.edu

**EQUIPMENT:**

- Two Scherping horizontal cheese vats (1,500 lbs.)
- Three open cheese vats (500 lbs.)
- Homogenizer and pasteurizer
- Tetra Pak Sterilab ultra-high-temperature processor (steam injection and indirect heating)
- High-pressure high-temperature extruder
- Process cheese cooker
- Ice cream freezer, continuous and batch
- Ultrafiltration, microfiltration, nanofiltration and reverse osmosis separation

## COURSES, SYMPOSIA AND EVENTS

- Basic Cheesemaking Short Course for Industrial Cheesemakers (Utah State University)
- Advanced Cheesemaking Short Course for Artisan Cheesemakers (Utah State University)
- Industrial Cheesemaking Short Course (with University of Idaho Extension)
- Artisan Cheese Symposium (Utah State University)
- GMP Workshop (Utah State University)
- HACCP Workshop (Utah State University)
- Advanced Sanitation Workshop (Utah State University)
- Behavior-Based Food Safety (Utah State University)
- SPC Workshop (Utah State University)
- SQF Workshop (Utah State University)

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**RESEARCHERS AND STAFF**

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**DAVID BRITT, PH.D.**

Assistant Professor, Biological Engineering  
Utah State University

[dbritt@cc.usu.edu](mailto:dbritt@cc.usu.edu)

Surface chemistry, interfacial water structure (hydration layers) and associated surface potential of membranes and biomaterials as related to protein absorption and biofilm formation; lactose-hydrogels for enhanced water retention in soil and crop yield.

**JEFF BROADBENT, PH.D.**

Professor, Dairy Microbiology  
Utah State University

[jeff.broadbent@usu.edu](mailto:jeff.broadbent@usu.edu)

Genomics of lactic acid bacteria, non-starter lactic acid bacteria in cheese; improvements in low-fat cheeses; functionality in high-moisture cheeses; effect of oxidation reduction potential on growth of lactic acid bacteria; use of adjunct cultures.

**CARL BROTHERSEN, M.S.**

Associate Director, Western Dairy Center  
Associate Director, Dairy Technology Innovation Laboratory  
Utah State University

[carl.brothersen@usu.edu](mailto:carl.brothersen@usu.edu)

Chemical diffusion of molecules in cheese matrix; oxidation-reduction potential in Cheddar cheese; value-added cheese.

**DAREN CORNFORTH, PH.D.**

Winder Professor, Meat Technology  
Utah State University

[daren.cornforth@usu.edu](mailto:daren.cornforth@usu.edu)

Dried milk mineral as an antioxidant in processed meats; lipid oxidation in precooked meats by dairy calcium and phosphoproteins; dried whey mineral as an antioxidant.

**CONLY HANSEN, PH.D.**

Professor, Food Engineering  
Utah State University

[conly.hansen@usu.edu](mailto:conly.hansen@usu.edu)

Anaerobic digestion as a waste management tool for decreasing effluent load from farms and food processing facilities and generation of energy.

**SILVANA MARTINI, PH.D.**

Assistant Professor, Lipids, Sensory Evaluation  
Utah State University

[silvana.martini@usu.edu](mailto:silvana.martini@usu.edu)

Technologies for designing healthy, high-quality, fat-containing foods for today's consumer; fat crystallization and phase transition theory; encapsulation; relationships between physicochemical properties of fats and emulsions and sensory characteristics.

**DONALD J. MCMAHON, PH.D.**

Director, Western Dairy Center  
Director, Dairy Technology Innovation Laboratory  
Professor, Dairy Food Processing  
Utah State University

[donald.mcmahon@usu.edu](mailto:donald.mcmahon@usu.edu)

Structure and function of casein proteins, milk coagulation, cheese manufacture, low-fat cheese texture and flavor, mozzarella cheese functional properties; membrane fractionation and processing of milk and whey; ultra-high-temperature processing of milk.

**WILLIAM R. MCMANUS, M.S.**

Research Technician  
Utah State University

[bill.mcmanus@usu.edu](mailto:bill.mcmanus@usu.edu)

Microstructure of foods, electron microscopy, confocal laser microscopy, low-fat cheese.

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**RESEARCHERS AND STAFF**

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**BRIAN NUMMER, PH.D.**

Assistant Professor, Extension Food Safety Specialist  
Utah State University

[briann@usu.edu](mailto:briann@usu.edu)

Food safety manager education, retail-foodservice food safety, small food entrepreneur food safety, home food storage, HACCP short course.

**CRAIG J. OBERG, PH.D.**

Regents Professor, Microbiology  
Weber State University

[coberg@weber.edu](mailto:coberg@weber.edu)

Cheese starter cultures, microbiology of lactic acid bacteria, probiotic cultures.

**KIMBERLY RASMUSSEN**

Dairy Technology Innovation Laboratory Staff Assistant  
Utah State University

[kimberly.rasmussen@usu.edu](mailto:kimberly.rasmussen@usu.edu)

**J. ANTONIO TORRES, PH.D.**

Associate Professor, Food Process Engineering  
Oregon State University

[j\\_antonio.torres@oregonstate.edu](mailto:j_antonio.torres@oregonstate.edu)

Novel and conventional applications of high-pressure processing with emphasis on bacterial spore inactivation mechanisms, in-line/real-time optical polarization measurements in food systems.

**MARIE WALSH, PH.D.**

Associate Professor, Dairy Chemistry  
Utah State University

[marie.walsh@usu.edu](mailto:marie.walsh@usu.edu)

Whey proteins (formulation, extrusion and production) in snack foods and meat extenders; immobilized enzyme reactors.

**ROBERT WARD, PH.D.**

Assistant Professor, Bioactive Food Components  
Utah State University

[robert.ward@usu.edu](mailto:robert.ward@usu.edu)

Lipid analysis and metabolism, plus novel bioactivities associated with the milkfat globular membrane.

**BALASUBRAMANIAN GANESAN, PH.D.**

Research Scientist  
Dairy Technology Innovation Laboratory

Utah State University

[g.basu@usu.edu](mailto:g.basu@usu.edu)

Genomics, metabolomics and informatics of lactic acid bacteria.

**DAVID IRISH, B.S.**

Dairy Processing Specialist  
Dairy Technology Innovation Laboratory

Utah State University

[david.irish@usu.edu](mailto:david.irish@usu.edu)

Cheesemaking, UHT processing, filtration and membrane processing.

**MICHAEL QIAN, PH.D.**

Associate Professor, Food Science  
Oregon State University

[michael.qian@oregonstate.edu](mailto:michael.qian@oregonstate.edu)

Flavor chemistry, food analysis and dairy chemistry. Characterization of aroma compounds, and chemical and biological generation in dairy, small fruits and wines. Instrumental analysis of food components.