DAIRY RESEARCH IN THE ENTIRE FOOD CHAIN

From genes to consumers



AARHUS UNIVERSITY

Dairy research activities at the Department of Food Science focus on characterization of milk components, milk as a raw material and changes induced by processing as well as health-related characteristics of milk and dairy products.

Key areas are protein chemistry (proteomics, milk genomics, enzymes), oxidative stability, structure and functionality of protein and lipid networks, metabolomics, bioactivity of milk constituents, and sensory science and preference studies in relation to milk and dairy products. Research is carried out on components that are transferred directly from feed to the final food product as well as research on how the metabolism of the animal influences the composition of the food and subsequently human health.

Our research is both basic and strategic and is carried out in close collaboration with Danish and international food industries, where results are applied in the development of new products and technologies.

DAIRY RESEARCH IN THE ENTIRE FOOD PRODUCTION CHAIN

GENES		Milk genomics: Connection between genes and the functionality of milk from different breeds Initiating research on the interplay between genetics, the cow metagenome, milk functionality and methane production
PRODUCTION	•	Quality effects of climate friendly feeding of dairy cows Differentiation of milk through feeding, breed and season, i.e. altering the sensory characteristics, functionality and composition of milk Effect of on-farm technology (milking method, concentration of milk, cooling) on quality and the shelf life of milk Cellular agriculture: Composition and properties of milk constituents from cultured animal or microbial
PROCESSING AND PACKAGING	•	New technologies within membrane filtration, heating and cavitation treatment and their effects on fats, proteins, enzymes and sugars Critical parameters in cheese and butter production e.g. reduction of salt, oxidative changes during production, packaging and storage, Quality of UHT milk and of lactose-reduced dairy products Physical-chemical characteristics of butter products and the interplay with processing Quality of mixed products based on dairy and plant proteins
HEALTH	•	Health effects of milk components and dairy products including bioactive compounds Impact of milk proteins, peptides, short- and medium-chain fatty acids from dairy products on obesity and lifestyle-related diseases The effect of processing and product matrices on digestibility and health aspects Variances in composition of human milk, especially the proteome
CONSUMERS	•	Differentiated dairy products and sensory quality Relating consumer preferences and liking to product knowledge and processing to ensure consumer acceptance of products, e.g. with respect to sensory and health- related aspects

RESEARCH FACILITIES

Department research facilities include process hall with UHT-DSI, homogenizers, membrane filtration, lab spray drier and twin-screw extruders.

Analytical instruments include differential scanning calorimeter, confocal microscope, rheometer, Texture analyzer, tensiometer, Reorox, Malvern mastersizer, equipment for mass spectrometry (GC-MS, LC-MS, MALDI-TOF/TOF, timsTOF, Q-TOF ion mobility source and LC QQQ).

Furthermore, the Department has state-of-the-art in vitro laboratoriesfor cell studies, separation and isolation of biomolecules (LC, one and two dimensional gel electrophoresis, preparative chromatography), low-field NMR, high-field NMR (600 MHz) and professional sensory science facilities. Additionally, the Department has access to excellent stable facilities for dairy cattle.

CONTACT

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