Call for Expressions of Interest

Food design, technology & biotechnology; Food safety & analyses; Health & nutrition; Food aid & better food for more people

The Danish Dairy Research Foundation calls for expressions of interest for research projects within Food design, technology & biotechnology; Food safety & analyses; Health & nutrition; and Food aid & better food for more people. Deadline is **Thursday, 25 November 2021, at 23:59 hours**. **Please use the application forms.**

Photo: Niels Åge Skovbo

According to the 'Strategy 2022. Increased competitiveness through dairy research', the Danish Dairy Research Foundation (DDRF) supports research and innovation within basic dairy research with clear application potential. Focus is specifically on interdisciplinary collaboration projects across different research groups – both national and international, because new knowledge and understanding of correlations are often created in the crossfield between professional disciplines. Interdisciplinary research and research, taking into account chain considerations, have top priority. Furthermore, sustainability and climate remain focus areas for the industry; therefore, the board would like to see these topics included in the expressions of interests. Areas could be sustainable diet, circular economy (e.g., raw materials and water), biobased or biodegradable packaging and processing using less energy. Digitalization is also a focus area for the board. Finally, cooperation with dairies and/or related industries (cultures, ingredients, equipment and analyses) is wished for. The DDRF board assesses the projects based on two main criteria: a) highly professional research quality and clear objectives and b) relevance to the dairy industry.

The Foundation calls for expressions of interest within the scope of 'Strategy 2022'. Below are current examples of the specific strategic focus areas.

Food design, technology & biotechnology

Mastering food design is paramount to fulfill consumer and customer demands. It is vital to understand the molecular properties of the milk ingredients and the way they interact with other components in the food matrix during processing, storage and at the end-user. In addition, we must understand structure, functionality and the interrelationship with sensory analysis and shelf life to develop new eating experiences for consumers.

A better understanding of how processing, packaging and storage impact product quality and shelf life is key relative to developing future sustainable products and dairy processes. In this context, it is important to study how storage outside the cold chain and packaging impact quality and shelf life, and it is key to find solutions that reduce food waste as well as climate impact of dairy products.

Call for Expressions of Interest

Food design, technology & biotechnology; Food safety & analyses; Health & nutrition; Food aid & better food for more people

Biotechnology, to include positive microbiology, biopreservation and fermentation and enzyme technologies, constitute key research areas with a view to developing and controlling the quality of dairy products, to include creating taste and texture experiences addressing consumer and customer needs.

Increased differentiation of products requires a hyperflexible production set-up and use of digital potential relative to production management. In addition, it is important to understand how quality can be secured and controlled through a 'quality by design' approach.

In a world where resources are under pressure, it is important to consider how we can produce more with less, in fact, utilize raw materials and resources like water and energy in the best possible way. An example could be processes that require less water and energy use. It is key for the dairy industry to continue production of sustainable products with high food safety and quality and documented, low environment and climate impact.

Relevant target areas:

- Effects of new, sustainable process technologies, to include packaging, separation processes and alternative heat treatment and preservation technologies, on product functionality, sensory properties, shelf life and/or bioavailability.
- Use of biotechnology in combination with process technologies to obtain optimization of production methods and development of new product prototypes and secure optimal resource utilization, e.g., by using sidestreams.
- Understanding how basic molecular interactions between milk constituents and/or ingredients impact functionality, sensory properties and shelf life of dairy-based products and mixed products, e.g., containing both dairy-based and plant-based raw materials.
- Fermentation technology that supports positive changes to the gut flora. This requires new technologies withing extrusion, emulsification, drying and spray coating technologies for microencapsulation of bacteria. Furthermore, fermentation technology enabling development of mixed products, containing both milk and plant-based ingredients, is an important research area.
- Online/at-line surveillance and control using measurement and data driven modelling relative to increased process efficiency, quality of end products and/or securing optimal cleaning processes.

Food safety & analyses

High food safety standards are vital in order that the dairy industry can maintain customer and consumer confidence. Therefore, research and innovation within food safety and appropriate analysis methods are key for measuring and preventing potential risks, at all times.

Documented high food safety all the way through the value chain is critical for getting established on new markets and retaining existing customers. At the same time, new product formulas, changed packaging solutions, changed and longer distribution channels and changed consumer patterns constantly challenge food safety. A research-based understanding of – and ability to predict – food safety risks when altering product formula is essential for the dairies. Examples include adding new ingredients, reducing sugar/salt content, changing water activity, pH or storage temperature, or altering process technologies and/or packaging.

New methods/approaches for quantitative and qualitative analyses of product safety, quality and shelf life, and for predicting undesirable growth of microorganisms and presence of undesirable compounds, together with development of online/at-line technologies for early control and prediction of product safety and shelf life – are key for documenting and controlling food safety through the entire value chain.

Finally, there is a need for establishing traceability systems providing transparency through the entire value chain in order to secure documentation and control of product safety and quality – thereby retaining a high degree of credibility.

Relevant target areas:

- Development of new, innovative solutions to prevent microbiological and chemical risks, to include effects of new ´production methods, packaging and alternative preservation technologies.
- Use of new high-throughput sequencing technologies and screening techniques as rapid prediction methods relative to microbiological safety.
- Use of artificial intelligence and existing data (Big Data) from the entire production chain to predict and control food safety relative to the dairy and dairy ingredients industry, and to secure traceability and transparency through the entire value chain.

Call for Expressions of Interest

Food design, technology & biotechnology; Food safety & analyses; Health & nutrition; Food aid & better food for more people

Health & nutrition

Production of healthy and tasty dairy products and milk-based ingredients forms the basis of a competitive dairy industry. Research-based documentation of the impact the dairy products have on our health and well-being is essential for positioning of these elements, and it is important to contribute to creating knowledge and documentation which can be included in the work of the authorities in implementing, e.g., legislation and dietary recommendations. Add to this, documentation of tools to be used in the industry's efforts to pinpoint consumer intake of dairy products tailored to relevant consumer segments.

A deeper understanding of the impact the products and their ingredients have on our health, as manifested through all age groups, is needed, to include how the diet can be tailored to the individual's needs – from before birth and throughout life.

It is important to understand the role of dairy products in the sustainable diet of the future – i.e., a type of diet allowing for nutritional needs relative to minimal climate impact, minimization of water resources, increased biodiversity and economic and social/cultural aspects.

Finally, the impact of dairy products and their ingredients, to include the importance of lactose and the amino acid composition on the intestinal flora and the metabolism, with children and grown-ups alike, is important with a view to understanding how the metabolites of the intestinal flora affect biomarkers important to the development of specifically lifestyle diseases and cognition throughout life.

Relevant target areas:

- Elucidation of mechanisms and food matrix effects that, e.g., in interaction with the intestinal flora can support the ability of the dairy products/dairy ingredients to prevent and reduce development of lifestyle diseases, to include the sensation of feeling full and controlling weight. This could include the use of artificial intelligence/machine learning to identify the connection between personal metadata and their clinical response with the aim to develop personalized nutrition.

- Mechanistic understanding of the importance of the dairy products' unique composition for the role of these products in a healthy diet throughout life and their ability to deliver and stimulate optimal nutritional intake. In respect of children, specific focus is on growth, cognitive functions, bone health and muscle functions. In respect of the older group of the population, focus is on prevention of malnutrition, osteoporosis and age-related muscle loss.

- Understanding how processing and product matrix composition (to include mixed products containing both milk and plant-based ingredients) impact nutrient intake and metabolism.

- Characterization – through scenario building or modelling – of the dairy products/ingredients' role in a sustainable diet that fulfills the official dietary recommendations. A holistic perspective should be taken encompassing factors related to environment, climate, economy and sociology (culture/habits).

Food aid & better food for more people

Both adequate access to food – not least access to inexpensive and nutritionally valuable products – and malnutrition continue to pose enormous barriers to sustainable development in many countries. Therefore, new knowledge is needed to ensure development and distribution of better and more reasonably priced, nutritious products to be provided to vulnerable population groups.

2.7 billion people live on less than USD 2.50 a day. This emphasizes the need for research and documentation that may subsequently support the dairy industry's collaboration with developing countries in order to improve the general standard of nutrition via development of inexpensive but nutritious products, where the dairy nutrients play an important part.

Research has shown that even small quantities of dairy products or milk components can remedy acute malnutrition due to the high nutrient content of these products.

Further documentation in this area is needed, to include understanding of how such products can be in demand/preferred by vulnerable populations groups.

The maximum DDRF funding for focus area 'Food aid and better food for more people' totals DKK 1 million per year.

Relevant target areas:

- Formulation and health documentation of economically sustainable foods, where milk and/or milk components are significant to the nutrition and health-related character of the products.

Call for Expressions of Interest

Food design, technology & biotechnology; Food safety & analyses; Health & nutrition; Food aid & better food for more people

- Documentation of the nutrition and health-related effects of the milk components as supplements to malnourished children (aged 2-12), teenage girls, pregnant and breastfeeding women, in order to increase the health status within these population groups.

- Documentation of sustainable use of local raw materials in the development of dairy products and/or dairy ingredient-enriched, nutritious products in areas of the world with food shortages.

What type of projects obtain funding?

DDRF is a non-commercial foundation. The Foundation initiates and coordinates basic dairy research that contributes to sustainable production of differentiated, safe and healthy milk-based products. This is done in close collaboration with the dairy industry and, e.g., universities, hospitals and the suppliers.

The projects are pre-competitive in nature and underpin research-based actions, subsequently leading to innovation at the dairies – having the result that the dairies are able to boost their competitiveness.

DDRF does not support research projects within primary production, projects characterized by product or process development, major equipment investments and projects which solely pertain to communication of research results.

Grant conditions and financing

DDRF initiates annual research projects with a total dairy foundation grant of approx. DKK 15-16 million. This is done partly via DDRF's own funds and partly via application to the Milk Levy Fund. Relative to projects ultimately funded by the Milk Levy Fund, DDRF initiates the scientific prioritization, whereas final decision to support the project is made after submission of the prioritized Expressions of Interest to the Milk Levy Fund. DDRF will assist in this process, if needed. The funds will not be granted until external grants and/or contributions from participating industry and/or research institutions, totaling a minimum of 50 percent of the total project budget, are available. It is the responsibility of the project applicant to obtain the remaining co-financing. If this cannot be done within approx. 18 months, DDRF is no longer obligated to support the project. The applicant may submit/resubmit a new application relative to subsequent calls.

Who can apply to the Danish Dairy Research Foundation?

We welcome applications from researchers from public and private research institutions, and we encourage collaboration with GTS (Advanced Technology Group) and private companies. When applying, please make sure that the management of the participating institutions and the industry partners have approved the application and given their written consent to the project.

Required format of the Expressions of Interest

In order to be evaluated by DDRF, the DDRF Expression of Interest forms must be used. The Expression of Interest - part 1 is submitted as a PDF-file, whereas the Expression of Interest - part 2 must be submitted as a Word document. Instructions for submission of the Expression of Interest appear on the application forms. Please note that the Expression of Interest (parts 1 and 2) should not exceed **5-6 pages** (A4 paper size; excluding items 11-13 in part 1). The application may be in Danish or English (excluding title and summary which must be completed in both Danish and English).

Application deadline of the Expressions of Interest is Thursday, 25 November 2021, at 23:59 hours. Please mail the application to mff@lf.dk. You will receive acknowledgement of receipt of the application. Applicants will be notified early February 2022.

Information and guidance

Further information may be obtained from the DDRF Secretariat:

Grith Mortensen
Danish Dairy Research Foundation
Danish Agriculture & Food Council
Agro Food Park 13, 8200 Aarhus N
Dir: +45 3339 4665; mobile: +45 4096 4114
E-mail: gmo@lf.dk

Kim Tram Sørensen
Danish Dairy Research Foundation
Danish Agriculture & Food Council
Agro Food Park 13, 8200 Aarhus N
Dir: +45 3339 4479; mobile: +45 2335 6833
E-mail: kts@lf.dk