Call for Expressions of Interest

Food design, technology & biotechnology; Food safety & analyses; Health & nutrition; Food aid & better food for more people; Impact of climate friendly feeding on the functionality, quality and taste of milk and dairy products.

The Danish Dairy Research Foundation calls for expressions of interest for research projects within Food design, technology & biotechnology; Food safety & analyses; Health & nutrition; Food aid & better food for more people; and Impact of climate friendly feeding on the functionality, quality and taste of milk and dairy products. Deadline is **Thursday, 28 November 2019, at 23:59 hours**. **Please use the application form.**

According to the new '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 digitalization are focus areas that the board would like to see included in the expressions of interests. Finally, cooperation with dairies and/or related industries (ingredients, cultures, equipment and analyses) is wished for. The DDRF board assesses the projects based on two main criteria, i.e. 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'. In the call, the Foundation also calls for expressions of interests within the impact of climate friendly feeding on the functionality, quality and taste of milk and dairy products. A one-off allocation of 2.7 million DKK has been made to this area. The funds for this area come from the liquidation of "Mælkeudvalget". Below are relevant 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 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 impacts quality and shelf life.

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 hyper-flexible production setup 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.

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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. 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.
- 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 new and known potential risks, at all times.

Documented high food safety all the way through the value chain is a sanitary factor for getting established on new markets and retaining existing customers. At the same time, new product formulas, 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 (e.g. adding new ingredients, reducing sugar/salt content, changing pH or storage temperature), or altering process technologies and/or packaging are essential for the dairies.

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 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 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 and alternative preservation technologies.
- Use of suitable omics technologies (to include whole genome sequencing) and screening techniques as rapid prediction methods relative to microbiological safety.
- Use of 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.

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 wellbeing 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.

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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 lactose, on the intestinal flora, with children and grown-ups alike, is important with a view to understanding how the composition of the intestinal flora relates to the existence and 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. Evaluation of the effect of high protein intake in relation to life style diseases is an important research area.
- Mechanistic understanding of the importance of the dairy products' unique composition for the role of these products in a healthy diet throughout life and as an element in sustainable meals, and 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 a sustainable diet that fulfills the official dietary recommendations – in a holistic perspective encompassing factors related to environment, climate, economy and sociology (culture/habits).

Food aid & better food for more people

Both access to food – not least inexpensive, nutritionally valuable products – and malnutrition continue to pose enormous barriers to development in many countries. Therefore, new knowledge and establishment of partnerships are needed to ensure better and more reasonably priced nutrition to be provided to vulnerable population groups. Research has shown that even small quantities of dairy products or milk components can remedy acute malnutrition as the nutrient content of these products is of a very high quality. Further documentation in this area is needed, to include understanding of how such products can be in demand/preferred by vulnerable populations groups.

2.7 billion people live on less than USD 2.50 a day. This emphasizes the need for research that can 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.

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

Relevant target areas:

- Documentation of economically sustainable foods that can secure better food for more people – where milk and milk components are significant to the nutrition and health-related character of the products.
- Documentation of the nutrition and health-related effects of the milk components relative to malnutrition among children (aged 2-12), teenage girls, pregnant and breastfeeding women, and maintaining a high state of health within these population groups.
- Documentation of criteria for successful distribution of nutritious products in areas with food shortages, to include awareness of e.g. taste, price, communication, innovative distribution channels and marketing strategies.

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Impact of climate friendly feeding on the functionality, quality and taste of milk and dairy products

Currently, intensive research is carried out targeted at climate-friendly production of milk. Measured per kg produced milk, Danish cows have developed into the best cows in the world in respect of optimal utilization of feeding and minimal environmental and climatic impact. Via research, we are already well on track – although we have not yet reached our goals. Introduction of climate-friendly feeding strategies is assessed to be key in climate optimization of the Danish milk production; therefore, it is of paramount importance to obtain a basic understanding of the impact of such initiatives on the end quality and functionality of the raw milk and the resulting impact on the choice of a sustainable diet.

Relevant target areas:

- Understanding how content of macro and micronutrients, taste, keeping quality and milk functionality are impacted by climate-friendly feeding.
- Understanding how possible changes in the quality of the raw material can be addressed at the dairy to maintain and guarantee the manufacture of healthy, tasty and safe products.
- Quantification of the end carbon footprint on targeted dairy products and milk ingredients as a function of introduction of climate-friendly feeding.

Please note that funding is NOT provided for feeding studies but will be provided for verification of the quality of the milk resulting from the research. Focus will be on the quality of the raw material and further processing at the dairy plant with a view to identifying any changes in functionality, nutritional value, taste, etc. of the milk.

Via these strategic priorities, the Foundation focuses on several important UN Sustainable Development Goals, e.g. #2, Zero Hunger, #3 Good Health, #6 Clean Water and Sanitation, #12 Responsible Consumption and Production, and #13 Climate.

Background

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 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 14 million + 2.7 million (on-off). 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.

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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 form must be used. The Expression of Interest, separate budget and any appendices must be submitted in one combined PDF file. In addition, items 1-15 of the application form must be submitted as a Word document. Instructions for submission of the Expression of Interest appear on the application form. Please note that the Expression of Interest should not exceed **4-5 A4-pages** (excluding items 16-19). The application may be in Danish or English (excluding items 1-2 which must be completed in both Danish and English).

Application deadline of the Expressions of Interest is Thursday, 28 November 2019, 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 by the end of January 2020.

Information and guidance

Further information may be obtained from the DDRF Secretariat:

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