



Call

Digital transformation of the food system

Application deadline: 27 August 2019

Date of decision (preliminary): 20 November 2019

Digital transformation of the food system

Open for applying: 2019-05-23

Apply before: 2019-08-27

Day of decision: 2019-11-20

 <p>What you can apply for?</p> <p>Projects with a clear interdisciplinary approach, which combines food science research with digital competences, digital tools etc.</p>	 <p>Who can apply</p> <p>Researchers with a doctoral degree, active at a Swedish university, college research institute , company (not sole proprietorships), or organisation , approved by Formas as an administrating organisation.</p>	 <p>How much can you apply for?</p> <p>Project length can be up to three years and the maximum grant for a three-year project is 15 million SEK.</p>
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Revisions

Changes in the call text after the date of publication will be specified here.

Date	Change
2019-05-23	Corrected link to reporting on page 15.
2019-05-28	Introduction: Changed the sentence <i>Our food system includes all raw materials, processes and infrastructures that are associated with primary production, trade, retail, transport and consumption of food</i> to

	<p><i>Our food system includes all raw materials, processes and infrastructures that are associated with primary production, industry trade, retail, transport and consumption of food</i></p>
<p>2019-05-28</p>	<p>Purpose and aim: changed the sentence <i>It may be projects that aims to apply digital tools in food science but also collaborations between researchers within academia/research institutes and public sector/industry in research- and development projects to create new digital services, products and processes in the food system.</i></p> <p>to</p> <p><i>It may be research projects that aims to apply digital tools in food science but also collaborations between researchers within academia/research institutes and public sector/industry in research- and development projects to create new digital services, products and processes in the food system.</i></p>
<p>2019-05-28</p>	<p>Purpose and aim: Changed the sentence <i>The call is the second within the National Research Programme for Food</i></p> <p>to</p> <p><i>The call is within the National Research Programme for Food</i></p>

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Description of the call

Introduction

Our food system includes all raw materials, processes and infrastructures that are associated with primary production, industry trade, retail, transport and consumption of food. The food system is the foundation for our food supply and there are clear connections between our food and our health. We are today facing a challenge to provide the global population with food and at the same time there is a big need of extensive changes in the food system in order to fulfil the global sustainable development goals regarding for example, climate and environment. The food sector has here much to gain by integrating the usage of cutting-edge digital competence and digital tools. In this call, within the National Research Program for Food, Formas therefore announces up to 60 million SEK over three years for projects with a clear interdisciplinary approach that combines food science research with digital competences to increase competitiveness and sustainability in the food system. In this call are also companies or other organisations approved by Formas as an [administrating organisation](#) welcome to participate and apply for funding in the call. Please observe that for participating companies apply [state aid regulations](#).

Background

Leading international institutions have already established that with future climate changes and the fast-increasing global population, humanity is facing a difficult challenge in providing the projected 10 billion people by 2050. With an increasing population, the demand for nutritious food will increase and at the same time there will be demographic changes, new groups of consumers and changed patterns of food consumption, which will make demands on the capacity of the food sector.

Key food decision makers, such as, the World Bank, are of the opinion that digitisation, that is transforming something digital, and digitalisation, digital communication and interaction between humans, things and activities, could improve the effectiveness in the whole food system as well as contribute to decrease the insecurity in food supply. It is the insecure food supply that are described as the main force behind the development of digital agriculture. The increased usage of Big Data (data of large volume that are collected with digital communication devices and the stored in computer databases for further processing) has been described as a foundation for the digitisation of the agricultural sector. Some analysisists predict that the usage of Big Data for precision agriculture and for modelling, for example, crop failures might aid to prevent farming losses and thereby contribute to combat the challenges in food security. Digitisation with focus on Big Data and automation is also an increasing field of interest within aquaculture. With Big Data several parts of the primary production on land and in water as well as in the food industry can be made automatic by robot technology and intelligent computer programs (Artificial Intelligence, AI). The automatic milking system, in which the cow is entering an automatic milking unit and being milked by a robotic arm while sensors record and analyses her health status, is an example of that, available since the early 90s.

Today we speak about the fourth wave of digitalisation, commonly referred to as the Internet of Things, which means that it is not just people who use the Internet to access and share information, but also different types of entities, such as vehicles, appliances, and machinery.

New digital tools are described to be the solution to decrease the losses and wastes in the food chain. For example, Sweden has a goal to halve the food waste by the year 2030. Redistribution of food with the help of digital tools. Digital market places in which both restaurants and suppliers can take part of valuable information about each other and match products and services for a more efficient trade, can also contribute to a decreased food loss and food waste. Digital market places and information platforms facilitates for smaller companies to reach out globally and the consumer can participate in trade directly without having to go through a retailer, which will reduce intermediate steps and contribute to an increased efficiency. It will provide the consumer with a larger opportunity to customise his or her food and choose food from own preferences regarding health, ethics and sustainability. Digital information about different products' climate impact can contribute to more climate friendly purchases. Furthermore, digital platforms enable an increased transparency and traceability in which authorities as well as individual consumers may ensure a reliable food safety. Through blockchain technology, where all parts in a chain share the same digital information, a more trustworthy information is obtained regarding buyers as well as regarding products and origin.

Even if a digital transformation of the food system is claimed to be able to contribute to an increased food security in the face of future climate changes and increased global population, there are critics who warn that the increased digitisation and digitalisation will result in new challenges, especially socio-ethnic ones. Will knowledge be replaced by algorithms and digital applications and how will this affect the development of the food system? Who owns the generated data? The access to generated data will also vary in different parts of the world because of different infrastructure, knowledge, rules and costs. Can an increased digitalisation contribute to an increase in vulnerability of the food system at different types of crises?

It is clear that the digitisation of society is becoming increasingly prevalent and affects producer as well as the consumer. Both researchers and recipients in the food system states that digitalisation, AI and automation is a prioritised area or tool in to increase the competitiveness of the food sector and a transformation towards a sustainable food production and consumption. The Organisation for Economic Co-operation and Development, OECD also have, in their most recent OECDs Science and Technology Outlook Rapport 2018, focus on how digitalisation techniques such as robots and AI may change and develop different research disciplines. OECD also states that the tools may help to bring the research forward and increase the quality.

Sweden's government has set five priority areas to be analysed from a digitalisation perspective by means of the "Digital first" approach. One of these areas is the food chain. In the government's action plan for the Swedish food strategy *A National Food Strategy for Sweden – more jobs and sustainable growth throughout the country* (prop. 2016/17:104) it is stated that the opportunities that digitalisation brings may result in new ways for the food industry to increase the productivity and a competitive food industry is important for a sustainable growth and employment.

In dialogue with actors in the food sector, the need for strengthen collaboration between and within all actors in the food sector; academia, research institutes, industry and public sector is frequently raised. While the possibilities to use digital tools in the food system are increasing it is noted that the

rate of implementation is in general slower compared to other sectors. One explanation is described to be the lack of collaboration between industry and academia.

Purpose and focus

The call aims to promote research projects with a clear interdisciplinary approach, which combines food science research with digital competences (for example, digital services, digital tools and Big data), to increase competitiveness and sustainability in our food system. It may be research projects that aims to apply digital tools in food science but also collaborations between researchers within academia/research institutes and public sector/industry in research- and development projects to create new digital services, products and processes in the food system.

Other questions of interest may be how different actors in the system are affected and integrated with the digital transformation, the development of artificial intelligence and automation, the fulfilment of society's increased demand for transparency and traceability, the reduction of loss and waste and the emergence of new digital business models. Another important issue is how an increased digital transformation of the food system affects society with possibilities and critical aspects such as health, law, ethics and morals.

New collaborations and collaboration between different parts of society is encouraged. In this call are also companies or other organisations, approved by Formas as an [administrating organisation](#), welcome to participate and apply for funding in the call. Please observe that for participating companies apply [state aid regulations](#). International collaborations are also encouraged.

Formas funds research for sustainable development. How the project is expected to contribute to meeting global challenges, the aims of the national food strategy and/or other relevant national or international strategies and aims, such as – for example – the government's sustainable consumption strategy, may also be elaborated on in the project application. Perspectives relating to digitisation or perspectives on gender, class, ethnicity and other social aspects should also be included in research projects where applicable.

The call is within the National Research Programme for Food. The research programme is a part of the government's action plan for the Swedish food strategy A National Food Strategy for Sweden – more jobs and sustainable growth throughout the country (2016/17:104). Its purpose is to support the knowledge and innovation system in order to help bring about increased productivity and innovation in the food supply chain and sustainable food production and consumption. Find out more about the [National Research Programme for Food](#) (in Swedish)

Project length may be up to three years and the maximum grant for a project is 15 million SEK. Formas has committed up to 60 million SEK for the years 2019-2021.

Before you apply

Who can apply

- Universities, colleges, research institutes, companies and other organisations that is approved by Formas as an [administrating organisation](#) can apply for funding under the Formas call for Digital transformation of the food system. Note: Sole proprietorship businesses cannot be granted funding under this call.
- At collaboration between academia and industry, all participating parts should be applicants (main applicant or co-applicants).
- Private companies and other organisations engaged in economic activity that want to apply for grants from Formas are subject to [state aid regulations for companies and other organizations engaged in economic activity](#). See the section on so-called de minimis aid further down in the text.
- All projects regarding the call Digital transformation of the food system for which a Formas grant is sought must have a responsible project manager. Main applicant must have a doctoral degree.

Your application

Projects that qualify for funding

- Grants for research projects can include, in addition to salary funding, funding to cover operating costs (consumables, equipment, travel, conferences, publication in peer-reviewed journals and open-access databases), depreciation costs for equipment, and premises costs. Grants for research projects can be used to cover salaries for researchers, PhD students and technical staff.
- Salary for PhD students can be granted for up to three years.
- Note that the total salary amount for a single researcher, PhD student or other staff must not exceed 100 percent of full-time employment. This means that additional salary funding cannot be granted to researchers, PhD students or other staff who already receive grants or contributions with full salary funding.
- Formas does not grant funding for annual salary increases.
- International collaboration. Grants from Formas can be used to fund research that is partly conducted outside Sweden, although the research must be initiated and managed from Sweden. The administrating organisation must be located in Sweden and approved by Formas and is responsible for hiring any foreign staff or paying for activities or services outside Sweden in accordance with the administrating organisation's guidelines.

Grant amount and project duration

In Formas' call Digital transformation of the food system, a project can apply for a maximum 15 million SEK for three years. Grants can cover a maximum of five million SEK per year, on average, over

the years the application is valid for. That means that applicants can apply for more than five million SEK for one year if the amount applied for during another year of the project period is less than five million SEK. Applicants may not apply for 15million SEK in total for a period shorter than 36 months. If the total amount applied for exceeds the average annual amount of five million SEK, the application will be rejected.

Co-funding is welcomed and encouraged. For example, co-funding may, in the form of time contributions (in-kind).

[Information about de minimis aid rules](#) as well as the costs that might qualify for aid to companies and other organisations engaged in economic activity can be found at Formas' webpage. **Note:** These rules do not apply to universities, colleges and research institutes. At a later stage of the application process, companies and organisations engaged in economic activity that are applying for funding must submit [proof of de minimis aid](#) (please observe that the form is in Swedish).

Formas will notify the organisations of when this proof is due. The statement of proof indicates whether you have received de minimis aid during the previous two fiscal years and the current fiscal year. If so, the organisation must submit proof that any de minimis aid received during this period does not exceed a total of the equivalent of 200,000 €.

The project's start date is preselected in Prisma and cannot be edited as project funding for the projects' first 12 months will be paid in December 2019. The funding may be spent throughout 2022 (no funding will be paid in 2022). Final reports, including a financial and a scientific report are requested three months after the end of the project period.

Language

Language Applications may be written in Swedish or English, but Formas recommends writing applications in English. Evaluation panel will include international experts. Applications that are written entirely in Swedish will be translated into English before being submitted to the Evaluation panel for review. It will not be possible to make changes to the application when it has been translated. The project summaries must be available in both Swedish and English. Please note that the budget specification should always be written in English: a Swedish budget specification will not be submitted for translation but will be reviewed by the international experts as it is.

A recommendation is to choose the Arial font in font size 12 for the information you enter in all text boxes.

How to apply

Applying in Prisma

Applications for grants under Formas' call Digital transformation of the food system should be submitted online in the [Prisma application system](#). The organisation behind the project must have an organisation account in Prisma.

Applicants from generally approved administrating organisations in Prisma (universities, colleges, research institutes)

In most cases, universities, colleges and research institutes already have an organisation account in Prisma and can then use those existing accounts. Project managers at these organisations apply for funding through their personal account in Prisma.

Applicants from non-generally approved administrating organisations (companies and other organisations)

If an organisation does not already have an account in Prisma, an appropriate representative should apply for an organisation account on the Prisma website in good time before the application is submitted. It may take a few weeks to get the application for an account approved. Indicate in the justification for the application that you are applying under Formas' communication call and state whether the applying organisation is a higher education institution, research institute, non-profit association, private company, etc. If the manager of the organisation account should be the project manager, then no separate personal account needs to be connected to the application. If another person should be the project manager, that person must have a personal account in Prisma.

If the organisation has an account in Prisma but is not a generally approved administrating organisation with Formas, it must notify research administrator [Thao Le](#)

To be able to submit the application, the organisation must specify its domicile. To choose a domicile, [such a structure must be created](#) in the organisation account.

Information your application must contain

The application registered in the Prisma application system must include a clear description of the project under the following sections. Please note, that in Prisma, write out the total amount you are applying for in kronor using digits. For example, SEK 1 million should be written as: 1 000 000 kronor.

Basic information

- Project manager
- Number of months applied for
- Start month
- Number of project years
- Calculated project time
- Project title in Swedish (max 200 characters including spaces)
- Project title in English (max 200 characters including spaces)

Note: *The project's start date is preselected in Prisma and cannot be edited as project funding for the projects' first 12 months will be paid in December 2019. The funding may be spent throughout 2022 (no funding will be paid in*

2022). *Final reports, including a financial and a scientific report are requested three months after the end of the project period.*

Abstract (maximum 2,000 characters each in Swedish and English)

A brief and clear description of the project’s content and objectives. The abstract must include a justification of and information about the project. Also include the result you expect the project to have.

Popular science description in Swedish (max. 4500 characters including spaces)

Popular science description in Swedish

Project description – Specific aims and objectives of the proposed project and a background description containing an overview of the research area (max 7 000 characters including spaces)

Describe the research that underpins the project. Describe why it is important to conduct the project. Describe the originality and expected outcome. Describe the project’s national and international potential. It is also important to describe how the focus of your research is related to one or more of Formas’ areas of responsibility: Environment, Agricultural Sciences and Spatial Planning. Describe the sustainability in the project in relation to Agenda 2030.

Project description - Summary of the structure, theory, methods, competence, performance and a plan for scientific deliverables (max 15 000 characters including spaces)

Describe how you will organise the project. Project plan, including activity and time table. Describe how the project results can be followed up. Describe the type of expertise available within the project, and state which researchers that are part of the project. Describe how the expertise is valuable for the project. Describe the project organisation, management and roles of participants. Reflect on gender equality and diversity when you put together the project team.

Project description- Potential societal value of the research question and planned communication with stakeholders/end users (max 8000 characters including spaces)

Describe the need/problem to be resolved, including benefit to society. Describe how stakeholders/end-users and experts in utilisation will be involved in the project. Describe the plan for communication with stakeholders/end-users.

References. List the in-line references pertaining to the above sections in a separate field (max. 5000 characters including spaces).

Budget

[Eligible costs for companies and other organisations conducting economic activity](#)

The project’s budget for administrating organisations must be specified in Prisma, where the following budgetary information is requested. Please note, that in Prisma, write out the total amount you are applying for in kronor using digits. For example, SEK 1 million should be written as: 1 000 000 kronor.

- **Staff expenses:** For any current employment positions, the salary in effect at the time of the application (including social fees) must be used for all subsequent years. For new employment positions, the starting salary at the administrating organisation must be used for all subsequent years. Note that Formas does not grant funding for annual salary increases. Eligible staff expenses for companies and other organisations conducting economic activity may be estimated at a maximum of 800 SEK per hour. Universities, colleges or research institutes are not subject to this limitation.
- **Equipment, land and Buildings**
- **Consultancy and licensing costs, etc.**
- **Other direct costs including travel**
- **Indirect costs:** Overhead costs. Universities, colleges and research institutes may charge a mark-up for indirect costs according to the applicable full-cost pricing method. Other project parties may charge a mark-up for indirect costs of up to 30 percent of their eligible staff expenses.
- **Budget specification.** Provide a brief justification for all salaries and other expenses. A description of the total project budget, including funding from other sources, should also be included. All other costs must be clearly justified. The budget specification is part of the evaluation.

The budget specification will be reviewed and should therefore be written in English (a budget specification in Swedish will not be translated)

Funding

There are four types of funding an applicant can specify in the application:

- **Requested grant from Formas:** Indicates the amount requested from Formas under the call for Digital transformation of the food system.
- **Other aid (public):** Indicates any funding received from other public funders towards implementing the project.
- **Other aid (private):** Indicates any funding received from other private funders towards implementing the project.
- **Self-funding:** Indicates the project parties' own contributions in terms of time, money and other resources.

Ethical considerations

You should specify whether there are specific ethical concerns in your project. If so, you must describe the relevant ethical considerations and how they will be managed. Examples include research that uses personal data, or experiments on humans or animals. [Read more about ethical considerations.](#)

Classifications

- **Subject areas**
Select a minimum of one and a maximum of three subject areas
- **SCB-code**

Select a minimum of one and a maximum of three SCB codes.

• Global goals for sustainable development

Select a minimum of one and a maximum of three of the 17 Sustainable Development Goals that best apply to your project. When selecting more than one goal, specify the goals in priority order. The goal that is most relevant to the project should be stated in the first box. Read an explanation of these goals on the UN Development Programme website. As the meaning of the goals is sometimes narrower than what the title indicates, we encourage you to follow the link and read in more detail about the goals you intend to specify to ensure that the intended research contributes towards achieving that particular goal.

Select at least one and a maximum of five keywords describing the project.

Specify which of the following parts of the food system your application relates to: Production, Processing, Distribution, Consumption, Food safety or Food waste (select one and write below). Categorize your application according to the aims, or the anticipated practical implications, of your applied project.

Administrating organisations

An administrating organisation is the organisation that receives the grant money from Formas when a grant is awarded. Formas distinguishes between generally approved administrating organisations (mainly universities, colleges and research institutes) that can apply under all calls, and administrating organisations that are approved under an individual call. In this call, Formas welcomes applicants from both groups.

Decisions on approving new administrating organisations will be taken soon after decisions on the call to ensure that the decisions are based on recent data. Prior to taking a decision, Formas performs checks on all parties that apply for funding and engage in economic activity in order to assess their financial stability and ability to complete the project. Applying for an organisation account in Prisma means that you are applying to become an administrating organisation. In connection with the application, please also contact responsible research administrator, [Thao Le](#).

A registered application is automatically sent to the administrating organisation after the call is closed, if it concerns an individual application. The administrating organisation then has **one week** to digitally sign the application. If an organisation is applying, the organisational representative must sign the application immediately when it is registered.

The administrating organisation is responsible for transferring part of the funding to co-applicating project partners.

CV of main applicant

The main applicant retrieves the data from the personal profile that is relevant for the current application. The CV information should include:

- **Education:** postgraduate (doctoral), undergraduate and graduate level.
- **Professional history:** Current position and relevant previous longer-term positions, postdoctoral residencies, research exchange visits relevant to the described research project, and any significant period of interruption in the research (such as parental leave, illness, military service or political duties).
- **Merits and awards:**
 - o **Associate professorships**
 - o **Supervision:** doctoral students, postdoctoral students, and exam project students; state the total number in each respective category and provide the names of the most relevant supervisions (max 10).
 - o **Grants awarded in competition:** Specify the most relevant grants (max. 10).
 - o **Prices and awards:** Specify the most relevant ones (max. 10).
 - o **Additional merits, including bibliometric summary:** Here the applicant researcher's entire bibliometric indicators should be summarised (max. 800 characters including spaces). This bibliometric summary should include: (i) the number of publications of various types, such as articles in peer-reviewed journals, book chapters, books and other monographs, conference papers and popular science contributions, and (ii) any other publication or citation specifications relevant to the applicant's field of research. Under "Additional merits," you can list other qualifications that are relevant to the application, such as any popular science publications or proven experience of collaboration and research communication (max. 10).
 - **Intellectual property:** For example, patents and open source software that you have developed (max. 10).

Publications of main applicant

The main applicant should list up to ten of the most relevant publications. Note that the publications should be linked from the personal profile in Prisma.

CVs of participants

Add the CVs of participants to the application as appendices in PDF format. A maximum of five are allowed. (Max 2 A4-pages each.)

Publications of participants

The project participants can add their publications (scientific or popular science) as a PDF (Max 10 MB and max 5 A4-pages).

Appendices

The following appendix can be uploaded if relevant for the application:

- **Appendix J.** Illustrations. If you need figures, tables or images to describe the project, you can upload them as attachments here. A maximum of one PDF attachment of 4 MB and 2 A4 pages can be uploaded.

How applications are evaluated

The evaluation will be based on the information found in the applications. All criteria must be addressed in applications, and applicants are encouraged to relate their applications to these criteria in clear and transparent ways. Any applications containing technical errors will be rejected.

Please note that the evaluation criteria described below have been specifically designed for this targeted initiative and hence are not the same as those specified on the Formas website

Potential, relevance and quality

- How well the project is aligned with the purpose and aims of the call
- The extent of the potential in the project to combine food science research with digital competences
- The extent of the potential of the solution in Sweden and internationally
- The extent to which the project demonstrates innovation, originality and quality,
- The significance of the results if the project is successful

Gender equality and sustainability

- How well thought out the gender equality aspect is (in the composition of the project group, the involvement of stakeholders/users and in the development of ideas and solutions).
- How well thought out the sustainability aspect is, and whether the project can contribute to the Agenda 2030 sustainability goals in the short or long term.

Feasibility

- The extent to which the planned activities are realistic to achieve the expected results during the project period
- The extent to which the time schedule is realistic
- The plausibility of the budget in relation to the project layout and expected results
- The extent to which the plan for communication with potential stakeholders/users is realistic

Actors

- The ability and competence of the project manager to implement the project
- The extent to which the project organisation and overall expertise is sufficient and relevant for implementation of the project

- How well stakeholders/users are involved in the project
- How well utilisation/commercialisation/innovation experts are involved in the project

Assessment of applications

The applications will be evaluated by a panel of active researchers as well as experts in the field of digital research and digital competence. Each application will be evaluated by four panel members. The panel's evaluations and prioritisation of applications will constitute information for Formas' Scientific Council. Formas will have the opportunity to revise the ranking based on a portfolio perspective to facilitate high-quality projects within the whole food system.

Grant award decisions

The Formas' Scientific Council plans to make its decision on November 20, 2019. These decisions will be published on the Formas website shortly afterwards. These decisions are final and cannot be appealed.

Reporting for granted projects

Each project that is awarded funding must submit a report to Formas containing a financial and a popular scientific summary in accordance with the decision. In the popular scientific summary, the project's goal fulfilment must be described and documented. [Read more about the reporting requirements](#) on the Formas website.

Formas may impose requirements on how projects must be reported in terms of content and results to enable distribution and practical application. In such cases, the award decision will contain more information about this. Formas may also require you to participate in conferences and similar events in order to create synergies and platforms for learning and knowledge sharing.

Applications submitted to Formas become publicly available documents after the decision is announced. However, Formas does not disclose information about an individual's business relationships or operating conditions, inventions or research results if the disclosure would be assumed to cause the individual suffering. If applications are requested, Formas conducts a confidentiality assessment.

Support and shortcuts

- [Prisma](#)
- [Prisma Support](#)
- [Rules on de minimis aid \(for companies and organisations\)](#)
- [Criteria for administrating organisation](#)
- [Ethical policy](#)

Contact information

Alexandra Jeremiasson, Senior Research Officer

For more specific questions regarding the call.

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Thao Le, Research Administrator

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