

# ONTARIO AGRI-FOOD RESEARCH INITIATIVE

## CALL FOR FULL PROPOSALS (2019/20)

November 2019

### Research and Innovation Branch

Ontario Ministry of Agriculture, Food and Rural Affairs

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[Ontario Agri-Food Research Initiative webpage](#)

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## Section 1. Initiative Overview

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### 1. 1. Objectives

Research is a key contributor to the success of the agri-food sector, strong rural communities, and the health and safety of food, people, animals and the environment. The new Ontario Agri-Food Research Initiative, under the Canadian Agricultural Partnership, offers funding for research that stimulates innovation to support the growth and competitiveness of Ontario's agri-food sector, promote food safety and strengthen rural communities. New knowledge and technologies help Ontario's agri-food sector businesses address challenges and expand market opportunities locally and globally.

The new initiative builds on the success of Ontario's New Directions (ND) and Food Safety (FS) Research Programs. Research previously funded through the ND and FS Research Programs has generated valuable new information and novel/improved technologies that are impacting Ontario's agri-food industry. Details on OMAFRA-funded research and innovation projects can be found by searching [Research and Innovation Project Summaries](#).

The Canadian Agricultural Partnership (the Partnership) is a five-year federal-provincial-territorial initiative to strengthen the agriculture, agri-food and agri-products sectors, and increase its competitiveness, prosperity and sustainability.

The Partnership supports projects in the following key priority areas, with [research and innovation](#) continuing to be a focus across all programming:

- [Economic development](#) in the agri-food and agri-products sectors.
- [Environmental stewardship](#) to enhance water quality and soil health.
- [Protection and assurance](#) to reinforce the foundation for public trust in the sector through improved assurance systems in food safety and plant and animal health.

### 1. 2. Research Priorities

Priorities for the Ontario Agri-Food Research Initiative can shift annually and reflect key opportunities and challenges facing the agri-food sector and rural communities. This Call for Full Proposals is focused on food safety, global market

analysis, automation and biobased production systems. See [Section 3](#) for a full description of the research priorities, focus areas and research questions. A Full Proposal must clearly demonstrate how one or more of the stated research questions is addressed.

For general program enquiries, please contact [Rajib.hazarika@ontario.ca](mailto:Rajib.hazarika@ontario.ca); 519-400-9482.

### **1. 3. Project Duration and Funding**

**Project Duration:** Up to 33 months.

Please note: Maximum project duration for questions under the [Global Market Analysis](#) research focus area is 22 months.

**Project Start:** A project cannot start prior to the date that OMAFRA approves the project. This date will be confirmed in the Research Funding Agreement. Eligible costs can only be incurred, invoiced and paid for on or after the start date.

**Project End:** Projects must be completed no later than January 31, 2023.

**Funding Available:** Maximum of \$150,000 in eligible costs per project (including a research maximum overhead up to 25%).

The applicant's organization must ensure that sufficient funding is secured to complete the project. If a project exceeds the approved budget, the applicant's organization must raise the additional funding required to complete the project; additional funds will not be provided from this Initiative.

There will be a 10 per cent holdback of reimbursement until a Final Report for the project is received and approved by OMAFRA. The Final Report submitted for the project must include a certification that the project has been completed within the project timelines stated in the Research Funding Agreement, and the project must fulfill all other requirements stated in the Agreement.

**Leveraged Funds/Co-Funding (Cash and In-kind):** OMAFRA strongly encourages applicants to obtain leveraged funds for this Initiative. The Ministry funds demand-driven research that is valued by the end-user and has ready receptors in policy, programs or the marketplace. Both cash and in-kind contributions from Co-Funders qualify as leveraged funds (see [Section 2.11](#)).

## 1. 4. Who May Apply

We invite universities and colleges, not-for-profit research institutions, and for-profit and not-for-profit groups/organizations (including agri-food commodity groups), with demonstrated capacity to perform quality research, to submit a Full Proposal. Lead Applicants must be located in Ontario and the proposed research must benefit Ontario's agri-food system and/or rural communities. Researchers outside the province of Ontario may collaborate on research projects. **Federal, provincial, and territorial government researchers, departments, ministries or agencies, and any employees thereof, are not eligible to receive funding from this Initiative but are eligible to collaborate on research projects.**

Project collaborators may include but are not limited to: for-profit entities, not-for-profit entities, government and non-government organizations, universities and colleges, and research institutions.

**Note:** Researchers who have received funding from OMAFRA but have outstanding required reports are not eligible for funding under this Initiative until OMAFRA has received and approved the outstanding reports.

## 1. 5. How to Apply

The Research Management System (RMS) is OMAFRA's on-line system for managing applications of Ministry-funded research programs and initiatives. Registering and logging into the [RMS](#) will take you to your Researcher Workbench where you can access all of the documents you need to understand and apply to this initiative.

**The 2019-20 Ontario Agri-Food Research Initiative call for proposals is a single stage application process (Full Proposal submission).**

An **Intent** to submit a Full Proposal step has been implemented to support peer review and review committee planning in advance of the submission deadline. This step requires that applicants complete a small number of fields in the 'General' and 'Peer Review' tabs in advance of the Full Proposal submission deadline. There is no 'submit' button or additional requirements for the Intent process; simply ensure those two tabs are completed by the [date](#) below to signal your Intent to submit a Full Proposal to the program. Applicants can continue to work on their application form until their application is completed and submitted on or before the Full Proposal submission deadline. Participation in the Intent process is recommended but not mandatory.

**Note on Internet Browsers:** The Research Management System works well in a variety of browsers, but some functionalities may not work well in Internet Explorer.

## **1. 6. Timelines**

**Intent to Submit deadline:** 14:00 hrs EST on Thursday, January 9, 2020.

**Submission deadline:** 14:00 hrs EST on Thursday, January 23, 2020.

**Note:** Applicants must allow time for their internal review processes.

**Notification of the Status of Full Proposals:** March 31, 2020.

**Project Start** (for the purpose of developing project milestones): Spring 2020. Actual start dates may vary but projects must be completed by January 31, 2023.

**Final Report Deadline:** 60 days following project completion and no later than March 31, 2023.

## **1. 7. Proposal Review**

### **Relevance Screen**

A pre-screening of proposals will be undertaken to determine the following:

- Eligibility of the Lead Applicant and their organization.
- Completeness of the proposal.
- Fit within stated research priorities (see [Section 3](#)).

### **Panel and Peer Review**

Full proposals that pass the Relevance Screen will be evaluated by both Peer Reviewers and Review Panels. The proposal title and abstract may be shared by OMAFRA with third parties for the purpose of finding expert reviewers who are not in a conflict of interest with the proposal. All reviewers are required to declare any conflict of interest and to sign a confidentiality agreement prior to accessing and reviewing any submission. Once reviewers are selected, they have access to the entire proposal for evaluation purposes.

Review Panels will evaluate the proposals according to the following criteria:

1. The project's fit within the research areas of focus that are described in [Section 3](#) and that are aligned with key research priorities under the Canadian Agricultural Partnership.
2. The project's anticipated significance and benefit in addressing the program priorities.
3. Quality and clarity of experimental design and project work plan. The review committee must understand the step by step process the project will use to achieve stated milestones.
4. The capabilities of the researcher and research institution to produce the anticipated outcomes to benefit Ontario.
5. The contribution(s) from collaborators and the impact on the quality of research attained and the networks established.
6. The effectiveness of the knowledge translation and transfer plan. Who are the target audiences/ users of your research, how will they be involved, how will the users benefit from the research and what methods will be used to reach these audiences?
7. The completeness and appropriateness of the proposed budget, evidence of stakeholder support and level of matching funds from eligible sources (requested and confirmed).

In addition, OMAFRA may conduct a literature search to determine if the proposed research topic has been sufficiently investigated elsewhere.

Peer Reviewers will assess the benefits, scientific merit and overall quality of proposals.

Applicants whose full proposals are selected for funding will be notified via email. Funding is contingent on the applicant's organization signing a Research Funding Agreement with the Agricultural Research Institute of Ontario (an agency of the Ontario Government reporting to OMAFRA) and on the applicant's compliance with all the terms and conditions in the Research Funding Agreement and the award notification.

## **1. 8. Intellectual Property**

Title to all intellectual property resulting directly from research funded through the Ontario Agri-Food Research Initiative will remain with the research institution or the institution's designate.

The Lead Applicant must report to OMAFRA any third-party IP contributions to the research project.

Any background intellectual property to be used in the project must be identified to OMAFRA and covered under a written agreement between the research institution and the owner of the background intellectual property.

The research institution must grant the Agricultural Research Institute of Ontario (ARIO) a non-exclusive, fully paid, royalty free, unencumbered license without time or territory limit to use and sublicense to any ministry of the Government of Ontario, any Agency, Board or Corporation thereof, (including any authorized agent of any of the above), all Newly Created Intellectual Property and any of the Recipient's Intellectual Property needed to utilize the Newly Created Intellectual Property. The granted license and any sublicenses ARIO grants shall be for the purposes of non-commercial uses, education, research, policy development, non-commercial publication and non-commercial breeding purposes by the licensed or sublicensed entity.

The Lead Applicant must disclose any new intellectual property developed by them during the research project and identify any technology capable of being commercialized to ARIO. This information must be included in the project's final report.

Commercialization and protection of the intellectual property is the responsibility of the research institution or its designate. The research institution or its designate will retain revenues generated from patents, licenses or royalties with the exceptions and exclusions noted in this section.

With 24 hours notice, ARIO or its representatives reserves the right to audit project progress as it relates to commercialization of intellectual property.




## Section 2. How to Complete the Application Form in RMS

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### 2. 1. Online Application Template in RMS

Applicants must register and login to OMAFRA’s online Research Management System (RMS) to access the application template and submit a proposal. If you have not used the RMS in the past, please register [here](#) to obtain login information. If you are registered in the previous [version of RMS](#) but believe you have not used the most [recent version of RMS](#), you should use the “forgot password” feature to update your password. For any issue with registering or logging in, please contact the RMS Administrator at [RMS@ontario.ca](mailto:RMS@ontario.ca).

Registering and logging into the RMS will bring you to your Researcher Workbench where you will select the Agri-Food Research Initiative. Click on “Determine Eligibility” to confirm your eligibility to apply for funding and to open an application template. If you have used RMS in the past, please note that there are changes that may require additional time to complete the on-line application. Of particular note is the team member invitation process which requires action from both researcher and team members in advance of the submission deadline.

Instructions and tool tips (denoted by ) are available in the RMS Application Template. In addition, tip sheets are available on the RMS Researcher Workbench Home page (‘Help’ icon).

The Full Proposal application consists of several sections that are navigated via tabs across the top of the on-line application in the RMS. All tabs must be completed. The majority of application instructions are provided in the RMS, but some additional guidance is provided below.

### 2. 2. Proposal Details

Applicants should take note of the following when developing their proposal and completing the application template.

#### Literature Review

- The literature review should provide a summary of relevant research and clearly identify the research gap.
- Where appropriate, the literature review should also provide the rationale for the experimental approach and the methods to be used.

## Methodology and Deliverables

- These fields have word limits and the system will truncate the text if the limit is exceeded.
- Make sure that enough detail is provided about the experimental plan for reviewers to understand how the project objectives will be achieved, and to evaluate the appropriateness of the methods chosen and statistical soundness of the approach (where appropriate).

## 2. 3. Lead Applicant

### Calculating the FTE (Full Time Equivalent) for the Project:

- Record the amount of time that you (and your team members) are devoting to your project per year.
- Select a yearly average if the amount of time will vary over the life of the project.
- Use the X.XX format (i.e. FTE=1.0 or 0.30).

## 2. 4. Co-Applicant (Optional)

### Definition

- A Co-Applicant is a researcher or partner that plays an important, well-defined and ongoing role in the development and implementation of the proposed research project.
- The Co-Applicant must accept the terms and conditions before the Lead Applicant can submit the application. Only the Lead Applicant can submit.
- One Co-Applicant allowed per project. A Co-Applicant is optional.
- The Co-Applicant must use their own workbench to edit the application and accept the terms and conditions.
- Only one person can edit a given application at a time - please exit the proposal when finished.

## 2. 5. Research Priority Selection

- First, identify the specific research question your proposal will address from [Section 3](#). Select the Research Priority and Research Focus Area associated with that question from the drop-down lists in the RMS.
- Note: All OMAFRA research focus areas are listed in RMS, but not all have research questions associated with them for the 2019-20 Ontario Agri-Food Research call. Please ensure you are selecting the correct priority and focus area based on the research question you selected from Section 3.
- Please also ensure you clearly identify the specific research question (from Section 3) you are addressing in the 'Alignment with OMAFRA Priorities' field in the 'Proposal Details' tab of the RMS application.

Research proposals that do not specifically address any of the stated research questions may be screened out prior to the peer and panel review.

## 2. 6. Inviting Research Team Members

Team members and Highly Qualified Personnel are identified in their respective tables in the Team tab in the RMS. The process of inviting team members is described in the application template and in the tip sheets. Co-applicants, Delegates (described below) and all Collaborators should confirm their participation in the project and be registered in RMS by the Full Proposal submission date.

A Delegate (optional – limit of one) is an individual whose only role is to assist the Lead Applicant in the creation and editing of the application and progress reports (for awarded projects). A Delegate must be part of the Lead Applicant's organization. A Delegate, while not formally a team member, is identified and invited from the team member tab in RMS. Delegates that play an active role in the research project must also be identified and invited as a Collaborator or identified in the HQP table in the RMS (this is important for performance measure reporting).

There is no limitation placed on the balance of the team composition, but all team members should play an active role as collaborators in the implementation of the project (advisory, researcher or knowledge broker). Eligible team members may include individuals from:

- The Lead Applicant’s institution (researchers and other support staff, e.g. technicians);
- Other University, College or research institutions;
- Private businesses;
- Industry / commodity organizations;
- Indigenous organizations and communities;
- Non-government organizations; and
- Federal, provincial or municipal government departments or agencies.

The FTE (full-time equivalent) you report in the team member table should reflect the total average annual time that each individual will contribute to the project.

## **2. 7. Highly Qualified Personnel (HQP)**

Under the Ontario Agri-Food Research Initiative, highly qualified personnel (HQP) are 1) undergraduate students and 2) graduate students or post-doctoral fellows receiving training through the proposed research. These HQP are captured separately from team members in the RMS. Please provide details on all HQP that will be involved in the project, regardless of their stipend funding source. Highly Qualified Personnel do not need to be invited. Proposals can move forward without specific persons identified as HQP if the positions are not yet filled. In this case, use TBD as the first and last name within the HQP table and complete all other fields except for e-mail address.

## **2. 8. Submitting Your Application**

All applications are required to have an individual assigned to the role of “Approver”. Lead Applicants should inform the OMAFRA contact person (for the relevant Priority Area - see [Section 3](#)) of the name and contact information of the Approver so that they may be entered into the RMS (if not already in the system).

- For research institutions, this is typically a member of the institution’s Research Office.
- For other organizations and private companies, the Approver will typically be a senior executive. Alternatives should be discussed first with the OMAFRA contact person.

**Note:** The RMS system will not allow you to submit an application after the submission deadline.

## 2. 9. Knowledge Translation and Transfer (KTT) Plan

The KTT tab in the application consists of two tables: KTT User Audiences and the KTT Plan. Instructions for completing these two tables are in RMS.

There are several resources available to assist you in creating your KTT plan which have been developed for OMAFRA-funded research programs. Visit the [KTT Services and Resources](#) page to access these resources.

- [Growing Knowledge Translation and Transfer in Ontario: A Manual of Best Practices](#): This manual outlines a collection of best practices in agri-food and rural KTT that can help guide you through the development of your KTT plan.
- [KTT Plan Checklist](#): A practical tool based on the Alliance KTT plan template. These guidelines, prepared by Alliance funding program reviewers, ensure your proposal covers key aspects of KTT planning.
- [KTT Example Plans](#): Examples of complete KTT plans to help provide ideas of innovative KTT activities as well as questions to consider as you answer each section.

Please refer to [Section 3](#) and contact the KTT Research Analyst identified in the specific research question if you have any questions about these resources or the KTT section of your proposal.

## 2. 10. Supporting Documentation

Supporting documentation should be in PDF format and may include:

- Team Member Supporting Documentation
  - CVs of the Lead Applicant and Co-Applicant
- Proposal Details Supporting Documentation
  - Relevant articles demonstrating industry needs
  - One-page diagram which illustrates the Methods described in the proposal
  - References for your Literature Review

- Other Supporting Documentation
  - Letters of support
  - Confirmation of leveraged funding
  - Award letters to be leveraged with this proposal

## **2. 11. Co-Funders**

### **Definition**

- A Co-Funder is a person or organization that contributes financial or in-kind support to the project.
- Both cash and in-kind contributions are eligible and co-funding is encouraged. Co-funding demonstrates industry and end user support for a project, which helps build a strong rationale for the research.
- Review committees will take into account the level and nature of partner support that could reasonably be expected for particular types of projects.
- All partner support needs to be fully documented and considered essential to directly carry out the work of the project. Applicants must provide support letters from their Co-Funders, confirming all types of support.

## **2. 12. Budget**

### **a. Salaries of Lead Applicant and Team Members**

Guidelines regarding the eligibility of salaries as direct costs to the Ontario Agri-Food Research Initiative are described in part b. Direct Operating Expenses. As with all budget items, applicant organization contributions need to be fully described in the budget notes, and valued reasonably and appropriately. OMAFRA reserves the right to determine the eligibility of all contributions and expenses on a case-by-case basis.

In-Kind Support is defined as items necessary to the success of the project that would have to be purchased from funds within the project budget if they were not provided by a co-funder.

Examples of in-kind support include goods and services, access to equipment and research facilities, and scientific and technical staff time contributing directly to the project.

The in-kind support must be described so reviewers may determine the appropriateness of the supports' estimated financial value. OMAFRA will only recognize contributions that are essential to the successful completion of the project.

## **b. Direct Operating Expenses**

Use the table in RMS to allocate the funds that you recorded in the 'Sources of Project Funding' section of the application template.

### **Eligible and Ineligible Expenses**

The eligible and ineligible expenses listed below are not exhaustive but provide a guideline for developing project budgets under the Ontario Agri-Food Research Initiative. OMAFRA reserves the right to determine the eligibility of salaries and other expenses on a case-by-case basis.

Some project costs that are ineligible for direct funding under the Ontario Agri-Food Research Initiative may be provided by Co-Funders. These contributions need to be described in the justification section of the budget template.

Please contact [research.omafra@ontario.ca](mailto:research.omafra@ontario.ca) with any questions regarding eligibility of budget items (either as direct project expenses or as matching contributions).

### **Salaries**

- **Eligible Expenses:**
  - Actual salary cost for employing experts to contribute directly to the project, such as:
    - trainee salaries, e.g. graduate and summer students, and Post-Doctoral Fellows.
    - contract technicians and other staff contributing directly to the project outcomes.
    - self-funded staff (i.e. individuals supported directly from research grants).

- Ineligible Expenses:
  - Salaries of permanent staff whose compensation is not specifically dependent on on-going research project funding.
  - Individuals with permanent academic appointments.
  - Individuals with Provincial, Federal or Municipal government employment.

**Note:** Salary costs of individuals involved in the investigative work of the project that are ineligible as direct project costs can be reported as in-kind contributions to the project (for example, salary costs of federal or provincial government/agency technicians). Time must be valued reasonably and based on the FTE contribution to the project.

#### **Materials and Supplies**

- Eligible Expenses:
  - Material and supplies, at fair market or company book value, as follows:
    - research supplies and disposables required for the project e.g. petri dishes, reagents, etc.
    - KTT and technology transfer related costs such as the organization of workshops and communication materials.
    - publication costs e.g. peer reviewed journals.
- Ineligible Expenses:
  - Common use items not specific to the project.
  - Any alcoholic beverages.
  - Support for meetings/events that would occur regardless of project funding.

#### **Research Station Fees (ARIO Research Stations)**

**Note:** There are no overhead fees calculated on research station fees.

- Applies to applicants who are requesting use of ARIO research stations.



- OMAFRA subsidizes 92% of the cost of research station use; this is calculated automatically in RMS and is recorded as an in-kind contribution. An additional 8% needs to be paid for by contributions from other funders.
- For further information on research station use and costs, please contact [research.omafra@ontario.ca](mailto:research.omafra@ontario.ca).

#### **Equipment Leases and Purchases**

- **Eligible Expenses:**
  - Equipment leases and rentals to conduct the project.
  - Equipment purchases (up to a maximum of \$10,000) that are essential to the project, that would not otherwise be acquired, and that will be purchased early in the life cycle of the project (usually in the first year). Note: Equipment purchases should not be funded by other government sources at 75 per cent or more.
  - Applicants must explain how the equipment will continue to support public benefits after the project is completed, and must demonstrate an estimate of fair market value for use of the equipment.
- **Ineligible Expenses:**
  - Purchase of common use items not directly related to the investigative work necessary to achieve project outcomes (e.g. computers, office equipment).

#### **Travel**

- **Eligible Expenses:**
  - Travel necessary to carry out the project (e.g. travel to research stations and field plots).
  - Travel to conferences and other KTT activities where project information is being presented.
- **Ineligible Expenses:**
  - Any alcoholic beverages.

- Travel costs (flights, mileage, accommodation, meal allowances etc.) for participants in workshops and meetings who are not part of the core project team.

**Note:** In order to be eligible, travel and meal costs must be identified and approved as such in the application for an approved project.

Eligible funding for travel expenses for an approved project may be claimed when the most economical transportation and accommodation (e.g., single accommodation in a standard room) is chosen.

The maximum eligible costs for personal vehicles driven within Ontario are:

<b>Number of Kilometres</b>	<b>Southern Ontario (\$/km)</b>	<b>Northern Ontario (\$/km)</b>
0-4,000 km	0.40	0.41
4,001-10,700 km	0.35	0.36
10,701-24,000 km	0.29	0.30
More than 24,000 km	0.24	0.25

Reimbursement for meal expenses is subject to the maximum eligible cost value set out in the tables below. Original, itemized receipts are required, and the eligible cost value will not exceed the actual amount spent. Taxes and gratuities are included in the maximum eligible cost value.

Reimbursement is for restaurant/prepared food only and not available for alcohol purchases.

Maximum eligible costs for meals in Canada (CAD):

<b>Meal Type</b>	<b>Maximum eligible costs</b>
Breakfast	\$10.00
Lunch	\$12.50
Dinner	\$22.50

Maximum eligible costs for meals outside of Canada (CAD):

<b>Meal Type</b>	<b>Maximum eligible costs</b>
Breakfast	\$20.25

Lunch	\$19.85
Dinner	\$50.00

#### **Indirect Costs or Overhead**

- Other indirect eligible expenses include meeting rooms, space or facilities, as long as the applicant can provide an estimate of the fair market value for use of the space.
- Applicants may use the indirect cost (or overhead) rates set by their organizations up to a maximum of 25% of eligible direct project operating costs.
- The per project funding maximum of \$150,000 includes any indirect costs (overhead). E.g. For a \$150,000 project using a 25% indirect cost rate:
  - Direct costs = \$120,000 ( $\$150,000/1.25$ )
  - Indirect costs = \$30,000 ( $\$120,000 \times 0.25$ )

#### **Other Ineligible Expenses**

- Costs incurred before the approval of the project by OMAFRA or after the project completion date identified in the Agreement.
- Costs incurred in preparing an application.
- Any cost not specifically required for implementation of the project.
- Normal costs of establishing, expanding or operating a business or organization.
- Goods or services provided by federal or provincial government departments or agencies
- Deposits (prepayments) for which goods or services are not yet fully received.
- Costs for training and skills development projects (i.e. outside of the research project) that fulfill any academic requirements towards completion of a diploma or degree.
- Mentoring and coaching, unless otherwise indicated in the Research Funding Agreement.

- Honorariums.
- Membership costs.
- Any travel or in-kind costs beyond those provided for in this Guide.
- Consultant and other contractor expenses for any hospitality (e.g., provision of food or beverages at events), incidentals or food.
- Hospitality (e.g., venue rental, food, beverages, AV, etc.).
- Purchase of land, building or facilities.
- Purchase of vehicles, transportation equipment, mobile material handling equipment (powered or unpowered), and construction and agriculture machinery.
- Financing charges, loan and lease interest payments, bank fees and charges as well as debt restructuring or fundraising.
- Gifts and incentives.
- Permits and approvals.
- Legal fees.
- Costs related to activities that promote Ontario products explicitly over those of another province or territory.
- Costs related to activities that directly influence or lobby any level of government.
- Taxes, including Harmonized Sales Tax.
- Any refund or rebate the applicant receives or is eligible to receive.

**Justification of Budget Items**

- Use the boxes to provide more details about expense items.
- Reviewers use this information to evaluate the appropriateness of budget items and to help determine the overall value for money for the project

## 2. 13. Uploading Documents for Your Application

All supporting documents **MUST be in PDF FORMAT in order to be included in the PDF version of your application.** Please note that reviewers only have access to the PDF version of your application and not the application template.

### Important Note About PDF Files:

PDF files that have **security restrictions** in place such as Content Copying or Extraction have been encrypted. **These encrypted files cannot be included** in your application. The security settings can be viewed by opening the PDF and clicking File> Document Properties >Security (steps may vary depending on the version of your PDF reader).

The PDF documents must be regenerated without the restrictions for them to be appended properly to your application.

## 2. 14. Suggested Peer Reviewers

Please suggest a minimum of 5 (and ideally up to 8) peer reviewers who may be contacted to review the full proposal. Ensure the suggested reviewers **are not in conflict of interest and can actually review your proposal.**

### Definition of Conflict of Interest:

A conflict of interest is defined as a conflict between your suggested peer reviewer's duties and their responsibilities with regard to the review process, and that person's private, professional, business or public interests.

### Eligibility criteria for peer reviewers:

1. They are not related to or employed by the lead applicant, co-applicant or any other member of the research team or the co-funders (people or organizations) of the project.
2. They have not co-authored a journal article or other publication with the lead applicant or co-applicant, or any other member of the research team or the co-funders (people or organizations) of the project during the past 2 years.
3. They will not benefit monetarily or in any other way from the funding of this project.

4. They are not in conflict in any way with the lead applicant, co-applicant or any other member of the research team or the co-funders (people or organizations) of the project.

## **2. 15. Declaration**

The 'Declaration Section' of the application serves as an electronic signature of both the Lead Applicant and his/her Co-Applicant (if applicable).

Both **Lead Applicant** and **Co-Applicant** (if applicable) **are required to check boxes that state they have read and accepted the terms and conditions** outlined in the application form and in the Call for Full Proposal document.

### **Note:**

- The Co-Applicant must access the proposal from their own workbench to check the acceptance box.
- The Lead Applicant cannot submit the application until the Co-Applicant has accepted the terms and conditions.
- Only one (1) person can edit the proposal at a time so remember to exit the proposal when you are finished.

### **Freedom of Information and Protection of Privacy Act**

The applicant(s) acknowledges that the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), on behalf of the Agricultural Research Institute of Ontario (ARIO), is bound by the Freedom of Information and Protection of Privacy Act (Ontario), as amended from time to time, and that any information provided to it in connection with this application, the proposed project, and any agreement that may be entered into with the ARIO, is subject to disclosure in accordance with that Act or pursuant to an order of a court or tribunal or a legal proceeding. OMAFRA may also share this proposal application and any supporting information in order to evaluate the application for funding.

### **Notice of Collection of Personal Information**

Any personal information on this form, such as information regarding the education and employment history of the lead applicant and research team members, is necessary to assist in assessing the qualifications of a proposal for

funding under the Ontario Agri-food Research Initiative. The information is collected under the authority of the Ministry of Agriculture, Food and Rural Affairs Act, R.S.O. 1990, c. M.16. Questions as to the collection of this information may be directed to [research.omafra@ontario.ca](mailto:research.omafra@ontario.ca).

Where any personal information related to team members is submitted, the applicant acknowledges that he/she has obtained the consent of these individuals to submit the information for the purposes of the evaluation of the application for funding. The applicant will provide evidence of the consent of these individuals to OMAFRA upon request.

## Section 3. Research Priorities

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This section contains the details and scope of the research priority and focus areas of this call. Applicant must first identify a specific research question from this section that will help to select the focus area and priority area in the online ([Research Management System](#)) application template. Each research question is accompanied by a description of the research problem and desired outcome to help focus the proposal.

### 3.1 Research Priority Area: Food Safety

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KTT: Barb Dillingham, [Barbara.dillingham@ontario.ca](mailto:Barbara.dillingham@ontario.ca)

#### a. **Research Focus Area:** Pathway Analysis

**Research question:** What are the main pathogen entry points and pathways for smaller-scale processed foods in Ontario?

**Research problem/gap:** There are concerns about the movement of pathogens through the food chain, particularly in small facilities/plants where research has typically not occurred.

**Desired outcomes:** Results would inform guidance and educational materials to advise Ontario's processors and regulators.

#### b. **Research Focus Area:** Prevention and Control

- b. (1) **Research question:** How can current interventions for Salmonella, Campylobacter and other pathogens in the Ontario poultry production and processing chain be improved to further reduce the risks to food safety (e.g. hatchery/breeder level)?

**Research problem/gap:** The presence of Salmonella and other pathogens in Ontario poultry is a continuing problem. Some jurisdictions have more stringent measures in place and have reduced the incidence of salmonella in live and processed poultry. Research findings could inform provincial operational protocols as well as prospective federal regulatory changes.



**Desired outcomes:** Results would provide evidence to revise or introduce new operational procedures to reduce and mitigate pathogen load in Ontario poultry, and to inform prospective federal regulatory changes or industry requirements.

- b. (2) **Research question:** What interventions at any point in the value chain are effective for enhancing reduction and mitigation of pathogens and/or hazards in foods while preserving desirable product traits?

**Research problem/gap:** Minimally processed foods can be contaminated with pathogens, which could lead to outbreaks in Ontario. Although there is a considerable amount of research on effective interventions, some are known to negatively impact product quality.

**Desired outcomes:** Project results would be used to corroborate, revise or introduce new operational procedures incorporating the most effective interventions that preserve the desired qualities in processed food, while also leading to a decrease in the number of reported cases of pathogens in food, the number of food recalls, and the incidence of food-related outbreaks and illnesses. The majority of interventions tend to be applied at the processing stage.

- c. **Research Focus Area:** Detection and Surveillance: Baseline Data

- c. (1) **Research question:** What is the risk profile for Ontario-grown minimally-processed fruits and vegetables and the relationship with production practices (e.g. irrigation water)?

**Research problem/gap:** Cases of pathogen contamination of minimally processed fruits and vegetables have led to outbreaks and recalls. More information and data are needed to understand where mitigation actions should be targeted to mitigate these risks.

**Desired outcomes:** Project results will help to establish the risk level for minimally processed fruits and vegetables that enter the Ontario and export markets, and the relationship between risk level and production practices. The results may be used to inform changes to regulatory policy as well as industry best practices.

- c. (2) **Research question:** What is the pathogen burden in market-ready lamb, sheep, goat and/or pork in Ontario?

**Research problem/gap:** There is no recent available data on pathogens in these meat products in Ontario. Data would establish an important baseline to which comparisons can be made in future. Furthermore, the existing surveillance data for hogs sent to slaughter is not recent (dating from 5 to 10 years ago) and little to none of it is from Ontario. Project results will provide an up to date risk profile of livestock processed at provincial slaughter houses.

**Desired outcomes:** Project results will help to establish the risk level of meat products that enter the Ontario market. The results may be used to inform changes to regulatory policy as well as industry best practices.

- c. (3) **Research question:** What is the pathogen burden in ground meat products prepared in small-scale, provincially-licensed facilities?

**Research problem/gap:** Currently there is no available data on pathogens in ground meats (beef, turkey, pork, etc.) processed at provincially licensed facilities. OMAFRA's meat program currently tests (individual) carcasses but not ground meat products that combine meats from different source animals. Data on ground meat products would establish an important baseline to which comparisons can be made in future.

**Desired outcome:** Project results will help to establish the risk level of ground meat products, allowing for monitoring and evaluation of the impact of prospective food safety protocols, industry practices, and regulations.

- d. **Research Focus Area:** Validation of Detection Methods

**Research question:** What is the value of using metagenomics and other CIDTs (Culture-Independent Diagnostic Tests) in pathogen detection or surveillance compared to conventional culture methods, particularly in primary production?

**Research problem/gap:** DNA testing is expected to replace conventional culture methods for detecting and undertaking surveillance of pathogens in food. Conventional methods take

longer and have lower specificity. The economic and other impacts of replacing traditional testing with metagenomics and other CIDs is not yet well understood.

**Desired outcome:** Technological advancement in detection and surveillance methodologies will inform government policies and industry practice. These methods could provide same-day flock pathogen testing results allowing for expeditious decisions.

### 3.2 Research Priority Area: Competitive Production Systems

OMAFRA contacts: Kelley Knight, [Kelley.knight@ontario.ca](mailto:Kelley.knight@ontario.ca);  
KTT- Luke Gartner, [Luke.gartner@ontario.ca](mailto:Luke.gartner@ontario.ca)

a. **Research Focus Area:** Technology Development: Automation

**Research question:** What are the barriers/drivers to innovative automation and robotics technology adoption by Ontario businesses in the agri-food sector? Where agri-food businesses have adopted innovative automation and robotics, were the original reasons for making the investments achieved/ were the outcomes positive, negative or neutral? In addition, how were barriers to adoption overcome?

**Research problem/gap:** Innovative technology is an important component that will help the agri-food sector increase its competitiveness and productivity. Automation and robotics adoption can also reduce critical labor shortages. It is therefore important to understand the factors that impact adoption by the sector.

**Desired outcome:** To remove barriers to and support drivers of automation and robotics adoption by the sector.

### 3.3 Research Priority Area: Trade, Market & Targeted Sector Growth Opportunities

OMAFRA contacts: Kelley Knight, [Kelley.knight@ontario.ca](mailto:Kelley.knight@ontario.ca);  
KTT- Luke Gartner, [Luke.gartner@ontario.ca](mailto:Luke.gartner@ontario.ca)

a. **Research Focus Area:** Global Market Analysis

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- a. (1) **Research question:** Which global hubs (e.g. Dubai, Ethiopia, Singapore, Netherlands) present the best opportunities for Ontario's agri-food sector to seek realistic success in the next 2-5 years? Which subsectors of Ontario's agri-food sector might be most compatible with each market's needs? What are the potential barriers to overcome? How can these barriers be addressed?

**Research problem/gap:** Increasing exports is an important element of Ontario's trade agenda and can be accomplished through expanding presence in existing markets, through new regions and channels, as well as looking for opportunities in new markets, such as hubs. Government has a critical role to play in market development and diversification, as success requires long-term commitment from a relationship and logistical perspective. Not enough is currently known about the opportunities that Ontario could maximize in global hubs. Considering the significant volumes of travellers passing through hubs, extensive food service opportunities exist.

**Desired outcome:** Understanding of the challenges and growth opportunities for Ontario's agri-food sector in key global hubs to potentially inform a strategic approach to guide key agri-food sectors to actively pursue growth

- a. (2) **Research question:** Among the secondary group of Ontario's U.S. state trading partners, which ones (i.e. Missouri, Kentucky, Tennessee, Indiana, West Virginia, Virginia, North Carolina, South Carolina), present the best opportunities for Ontario's agri-food sector to seek realistic success in the next 2-5 years? Which subsectors of Ontario's agri-food sector might be most compatible with each market's needs? What are the potential barriers to overcome, particularly in terms of logistical and transportation challenges? How can these barriers be addressed?

**Research problem/gap:** The long-term trend holds that the U.S. is the largest and most important export market for Ontario's agri-food sector: in 2018, 95% of Ontario's agri-food exports to the U.S. were value-added exports. Ontario's top U.S. trading partners are concentrated in the Northeast and Mid-Western regions of the country, in addition to Florida, Georgia, Texas and California. Highly integrated and well-established north-south supply chains facilitate this ongoing, mutually beneficial two-way trading

relationship. While Ontario has much success in the U.S., the full potential of the market is far from being realized. The entire agri-food market in the U.S. (including retail, food service, etc.) is worth \$1.84 trillion USD. With Ontario's 2018 food exports at \$11.9 billion CDN, the ON market share of the domestic U.S. food market is less than 1%. Even if Ontario were to double its food exports, the gains would be minor in comparison to the remaining opportunities for growth. Ontario food manufacturers have ample opportunity to work with retail and food service buyers beyond the Northeastern and Mid-West regions. Ontario could likely seek significant growth in the Southern states, to fill the gap between Ohio and Florida starting with the retail channel. Not enough is currently known about the opportunities that Ontario could maximize and the existing challenges to that success in the secondary U.S. states that Ontario trades with, beyond its top trading partners.

**Desired outcome:** Understanding of the challenges and growth opportunities for Ontario's agri-food sector beyond its top trading partners to inform a strategic approach to guide key agri-food sectors to actively pursue growth in key channels in those markets.

- a. (3) **Research question:** Which Southeast Asian markets who are CPTPP partners (i.e. Japan, Malaysia, Singapore, Vietnam) and others in the region (e.g. Indonesia, Philippines, Taiwan, South Korea) present the best opportunities for Ontario's agri-food sector to seek realistic success in the next 2-5 years? Which subsectors of Ontario's agri-food sector might be most compatible with each market's needs? What are the potential barriers to overcome? How can these barriers be addressed?

**Research problem/gap:** Through extensive stakeholder engagement on the development of the OMAFRA International Trade and Market Access Strategy in 2019, ITPB heard from a wide range of key sectors that market development and diversification opportunities are emerging in more Southeast Asian markets than other areas of the world (e.g. for pet food, baked goods, agri-tech, meat, etc.). Since Canada is a CPTPP partner and has free trade agreements with South Korea and is exploring with the ASEAN group, the time is right to undertake further analysis of these markets to understand the scope of

opportunities and challenges from an Ontario perspective. Increasing exports is an important element of Ontario's trade agenda and can be accomplished through expanding presence in existing markets, through new regions and channels, as well as looking for opportunities in new markets, such as hubs. Government has a critical role to play in market development and diversification, as success requires long-term commitment from a relationship and logistical perspective. Not enough is currently known about the opportunities that Ontario could maximize in key Southeast Asian markets. Considering the significant volumes of travelers passing through hubs, extensive food service opportunities exist.

**Desired outcome:** Ontario's agri-food sector in key Southeast Asian markets to potentially inform a strategic approach to guide key agri-food sectors to actively pursue growth.

- a. (4) **Research question:** What are the opportunities and challenges for Ontario's agri-food exporters interested in using e-commerce channels in key Asian markets (e.g. China, South Korea) in the next 2-5 years?

**Research problem/gap:** A growing trend in key Asian markets is increased e-commerce in agri-food. It would be helpful to know what barriers Ontario agri-food companies are facing in using e-commerce to export their products outside of Ontario. Once more is known about the scope of those barriers (e.g. shipping costs, logistics, non-tariff barriers, consumer preferences, etc.), then OMAFRA will be able to better consider the capacity of the Ontario agri-food sector to possibly meet demands (e.g. large enough scale; right products; etc.).

**Desired outcome:** Understanding of the challenges for Ontario's agri-food sector in key Southeast Asian markets to inform a strategic approach to address those barriers if the opportunity merits the effort.

- a. (5) **Research question:** How do national and sub-national governments in other parts of the world collaborate to improve market access issues? What types of sub-national interventions in market access advancement have proven to be effective? What can we learn from trade-related coordination between sub-national and national governments, in Canada and abroad? Have

other provinces in Canada or states in countries abroad successfully employed specific models when trying to advance market access issues with the federal government? Could some of these models be adapted to the Ontario-Canada relationship?

**Research problem/gap:** As Canada moves to secure and implement new and existing trade agreements and diversify into existing and new international markets, it is increasingly important to develop a capacity to address/advance market access issues. To support this work, OMAFRA is seeking to strengthen the use of international trade data and intelligence to better understand the impacts of existing and emerging market access issues on the Ontario agri-food sector. It is important to understand how Ontario can discover and maximize its distinct position vis-à-vis other provinces; for example, by looking for best practices in agri-food trade from other subnational jurisdictions.

**Desired outcome:** Understanding of how sub-national jurisdictions influence the advancement of market access issues to potentially inform a strategic approach for Ontario's agri-food sector.

b. **Research Focus Area:** Value Chain Analysis and Development: Bio-Based Production Systems

- b. (1) **Research question:** How can bio-based feedstocks for biomaterials, biochemicals and bioenergy be identified, developed and commercialized? What policy instruments, incentives and/or changes to provincial and municipal regulations, supply chains, market structure, and/or infrastructure need to be developed to facilitate the growth of Ontario's bio-based sector domestically and abroad to support transition away from petroleum-based products and processes

**Research problem/gap:** There is increasing interest in transition away from petroleum-based products and processes. The demand for increased plant-based products is expected to drive new economic opportunities for purpose grown feedstocks/biomass, organic residues/food wastes and other bio-based by-products. For example, Michelin plans to reduce its industrial carbon footprint by 50% by 2050 and Lego launched a range of plant-based plastic toys in 2018. Other companies/retail stores in the value chain, such as IKEA, Lego, Danone, Walmart, and Nestle are incorporating policies for reducing fossil-based products and

processes with those that are bio-based. Understanding these new market opportunities (and their challenges within current understanding) for Ontario is important.

**Desired outcomes:** Understanding of emerging opportunities for Ontario bio-based sector focusing on new markets for Ontario's agricultural operations.

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