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## Appendix 1 Activities considered as food processing in this report

| Activities & products considered as 'processing' | Activities & products *not* considered as 'processing' |
|---|---|
| Custom 'toll' processing | Seed cleaning |
| Fruit and vegetable processing: | Dehulling grains |
| Dehydration | Sale of bulk grains in packages larger than retail packs |
| Freezing | Cleaning fruits or vegetables |
| Canning | Egg grading or packaging |
| Cutting/slicing for packaged products only | On-farm milk production |
| Slaughter: | Pet food |
| Killing, on and off farm if legal and facility is considered as organic for the processing activity | Natural Health Products |
| Further cutting and packaging, on and off-farm if legal and facility is certified for the processing activity | Animal feed |
| Maple processing: | All non-food products, including textiles and body care products |
| Maple syrup or product manufacturing by entities considered as 'processors' by certifiers | Products that are not manufactured in Canada |
| Syrup or product production by producers that sell syrup in container sizes less than 5 L under their own label direct to retail or to consumer or who direct market maple products | |
| Coffee: | |
| Roasting beans for direct sale and or packing products under an entity's own label | |
| Eggs: | |
| Only further processing of eggs is included | |
| Multi-ingredient foods | |
| Grain Processing: | |
| Flaking | |
| Milling | |
| Baking | |
| Oil extraction | |
| Dairy: | |
| Further processing of milk into powder, cheese, whey, fluid milk for human consumption, ice cream, sour cream, milk components, etc. | |
| Beverages: | |
| Any manufacturing process producing drinks for human consumption that can be certified organic (i.e. not pure water) | |

## Appendix 2 Food processing aids and additives in which GE technology may be a concern*

| Additive or processing aid | Typical use in food processing | Description of issue | PSL |
|---|---|---|---|
| **Acids** | | | |
| Citric | Used to add flavour to beverages and confectionary, antioxidant, souring agent, preservative, pH balancer, reduces coagulation of fat, livestock carcass wash | Produced using the fungus, A*spergillus Niger.* Both GE and non-GE strains of the fungus are available | Citric acid produced by non-GE fungal strains is allowed |
| Lactic | Used to regulate pH, extend shelf-life and enhance flavour | Produced by lactic acid bacteria (LAB) which convert simple sugars to lactic acid. LAB have been genetically engineered for targeted food applications. GE corn is also a common source of sugar for LAB | Lactic acid is allowed provided that it is produced using non GE bacteria using a feedstock that is not itself GE |
| **Casein** | Used as a clarification agent in wine making | Derived from milk. In some jurisdictions, including the U.S., rBST is allowed. Not an issue for domestically produced casein | Must not come from the milk of animals treated with rBGH |
| **Colouring agents** | Food colour | Some natural colours such as the yellow used in cheese from seeds of the Annatto tree or lycopene from tomatoes may be made using GE technology | Must use non-GE sources |
| **Enzymes** | Used to convert starches to sugar, clarify fruit juice, clot milk protein to make cheese | Some enzymes such as chymosin (rennet) are produced using GE organisms. Chymosin derived from the stomach lining of ruminants is allowed | The following sources are permitted:<br>a. any preparations of enzymes normally used in food processing derived from edible, non-toxic plants, non-pathogenic fungi, or non-pathogenic bacteria<br>b. derived from animals - shall be organic if commercially available: rennet; catalase from bovine liver; animal lipase; pancreatin; pepsin; and trypsin.<br>c. egg white lysozyme |

| Additive or processing aid | Typical use in food processing | Description of issue | PSL |
|---|---|---|---|
| **Flavours** | May contain GE corn sweeteners. | Common flavours such as vanilla are most often produced using fermentation processes by organisms that have been altered by mutagenesis Derived from non-synthetic sources (such as plants, meat, seafood, micro-organisms, etc.) using approved methods and substances | |
| **Lecithin** | Emulsifier often used in dairy, dairy alternative products and chocolate | Derived by degumming oil which is often GE soy | Shall be organic if commercially available. Non-GE sources include sunflower oil, but it is more expensive than soy |
| **Micro-organisms** | Used as starter cultures for fermented foods | Lactobacillus used in dairy cultures may be GE | Lactic acid is allowed provided that it is produced using non GE bacteria using a feedstock that is not itself GE |
| **Starch** | Thickener | May be derived from GE corn | From rice and waxy maize - shall be derived using allowable substances |
| **Vitamins** | | | |
| Vitamin A | Antioxidant used in oils and fats | Commonly made with GE soy. Can also be produced from an organism which itself is genetically engineered. Can be attached to carrier molecules which may be produced using GE technology. Carriers are often not declared on labels and manufacturers are reluctant to share ingredients and methods | Shall be used if legally required. The following non-dairy substitute products may be fortified on a voluntary basis, if legally permitted: plant-based beverages, products that resemble cheese, and butter substitutes |
| Vitamin B2 | Vitamin | Primarily manufactured using a fermentation process which uses a genetically engineered organism. Can also be extracted from GE soy oil | Shall be used if legally required. The following non-dairy substitute products may be fortified on a voluntary basis, if legally permitted: plant-based beverages, products that resemble cheese, and butter substitutes. Non-GE variants are commercially available |

| Additive or processing aid | Typical use in food processing | Description of issue | PSL |
|---|---|---|---|
| Vitamin B12 | Vitamin | Chemically synthesized or made using GE organisms | Shall be used if legally required. The following non-dairy substitute products may be fortified on a voluntary basis, if legally permitted: plant-based beverages, products that resemble cheese, and butter substitutes. Non-GE variants are commercially available |
| Vitamin C | Vitamin, antioxidant, preservative, anti-browning agent used on fruits and vegetables, promotes yeast growth in bread making | Artifical form is made through chemical synthesis or fermentation. A two-step fermentation process has been used to develop a GE organism that then produces ascorbic acid | Shall be used if legally required. The following non-dairy substitute products may be fortified on a voluntary basis, if legally permitted: plant-based beverages, products that resemble cheese, and butter substitutes. |
| Vitamin D | Vitamin | May be attached to carrier molecules which may be produced using GE technology. Carriers are often not declared on labels and manufacturers are reluctant to share ingredients and methods | Shall be used if legally required. The following non-dairy substitute products may be fortified on a voluntary basis, if legally permitted: plant-based beverages, products that resemble cheese, and butter substitutes. Natural form available from citrus fruits |
| Vitamin E | Vitamin | Usually extracted from soy, which is often GE. Can also be derived using a GE self-cloning process. May be attached to carrier molecules | Shall be used if legally required. The following non-dairy substitute products may be fortified on a voluntary basis, if legally permitted: plant-based beverages, products that resemble cheese, and butter substitutes |
| Vitamin K | Vitamin | May be attached to carrier molecules which may be produced using GE technology. Carriers are often not declared on labels and manufacturers are reluctant to share ingredients and methods | Shall be used if legally required. The following non-dairy substitute products may be fortified on a voluntary basis, if legally permitted: plant-based beverages, products that resemble cheese, and butter substitutes |

| Additive or processing aid | Typical use in food processing | Description of issue | PSL |
|---|---|---|---|
| **Yeast** | Used to leaven bakery products | The substrate used in microbial fermentation may contain GE components. Processors should use organic yeast or the non-synthetic alteratives at right | If not commercially available, these non-synthetic sources may be used:<br>a. autolysate<br>b. bakers'<br>c. brewers'<br>d. nutritional<br>e. smoked.<br>Growth on petrochemical substrate and sulphite waste liquor is prohibited. Non-synthetic smoke flavouring process shall be documented |
| **Xanthan gum** | Dozens of uses including stabilizing emulsions, enhancing mouthfeel, improving consistency, thickening, etc. | This is a polysaccharide produced by fermentation of corn sugar, or possibly whey by *Xanthomonas campestris*. GE strains of this bacterium are involved in commercial production of xanthan gum. | Must not be derived from GE organisms. When non-GE bacteria are used, the bacteria must not be fed on GE corn or milk sugars |

*This is not an exhaustive list. Processors must be prepared to provide certifiers with documentation that GE technology was not used for each ingredient and additive used in a food product. We use the definition of genetic engineering in section 3.27 of the Canadian Organic Standard - CAN/CGSB-32.310-2015, amended March 2018.

Genetic engineering refers to techniques by with the genetic material of an organism is changed in a way that does not occur naturally by multiplication and/or natural recombination. Examples of the techniques used in genetic engineering include, but are not limited to:

- recombinant DNA (rDNA) techniques that use vector systems;
- techniques involving the direct introduction into the organism of hereditary materials prepared outside the organism;
- cell fusion (including protoplast fusion) or hybridization techniques that overcome natural physiological, reproductive or recombination barriers, where the donor cells/protoplasts do not fall within the same taxonomic family.

Unless the donor/recipient organis is derived from any of the above techniques, examples of techniques not covered by this definition include:

- in vitro fertilization;
- polyploidy induction;
- cell fusion (including protoplast fusion) or hybridization techniques where the donor cels/protoplasts are in the same taxonomic family.

## Appendix 3 Organic food processing survey questions

1. Which of the following options best describes your business? If neither of these options applies, you can skip the rest of the survey.
   - Food processor
   - Food processor and producer

2. How long has your business produced organic food products?
   - < 1 year
   - 1-5 years
   - 6-10 years
   - >10 years

3. Choose the option below that best describes your company's business model.
   - Organic only
   - Organic and conventional

4. If you selected the second option in Q.3, please choose the option from the list below that best describes how your business manages conventional and organic production.
   - Organic and conventional runs are done on different days of the week
   - Organic and conventional runs are done simutaneously in different facilities or in different parts of the same facility
   - Organic and conventional products are processed at different times of the year
   - Other (specify)

5. Please list the top ten (by sales) organic food products that your company manufactures (e.g. bars, ready-to-serve meals, etc.). Do not include conventional, non food, pet food, or animal feed products.

6. What were your company's annual TOTAL SALES from ALL food products for your last fiscal year?
   - <$50,000
   - $50,000-$999,999
   - $100,000-$499,999
   - $500,000-$999,999
   - $1 M - $4.9 M
   - $5 - $25 M
   - >$25 M

7. What proportion of your business's total sales revenue for its last fiscal year were generated from sales of ORGANIC food products?
   - <10%
   - 10-29%
   - 30-49%
   - 50-74%
   - 75-99%
   - 100%

8. What was your company's growth in ORGANIC food sales in the last two years for which you have financial statements?
   - Sales declined
   - Sales were similar
   - Increase of 0-4%
   - Increase of 5-9%
   - Increase of 10-19%
   - Increase of > 50%

9. Do you plan to expand or decrease the number of ORGANIC food products that your business offers in the next fiscal year?
   - Expand
   - Decrease
   - Stay the same

10. Do you plan to increase or decrease the volume of ORGANIC ingredients that you use in the next fiscal year?
   - Expand
   - Decrease
   - Stay the same

11. In which sales channels did your business sell ORGANIC food products in your last fiscal year? Choose all that apply.
   - Retail
   - Wholesale
   - Private label
   - Internet
   - Food box
   - Farmers's market
   - Restaurantants or Food Services

12. Please indicate the percentage of your company's ORGANIC food sales in each of the following markets for your last fiscal year. Note that the total should equal 100%.

- Within your province
- Within your region (e.g. Atlantic Canada)
- Within Canada
- United States
- Europe
- Asia
- Other (specify)

13. Does your company have any other certifications (or make any claims) in addition to organic. Choose all options from the list below that apply.

- Allergen-free
- Local
- Kosher
- Halal
- Fair trade
- Vegan
- Vegetarian
- HACCP
- Gluten-Free
- Other (specify)

14. How does your business distribute its organic food products? Choose all options from the list below that apply.

- We work with a national distributor
- We distribute our own products
- We work with a regional distributor
- We work with a local distributor
- We work with an international distributor

15. Please indicate the majority ownership of your company.

- Canadian
- American
- Mexican
- Asian
- Don't know
- Other (specify)

16. What is the ownership structure of your business?
Private corporation

- Public corporation
- Sole proprietorship
- Unincorporated partnership
- Cooperative
- Other (specify)

17. How many employees, including permanent, seasonal and casual, but excluding contract employees, did your business employ during the last fiscal year? Choose one option that represents the highest number of employees reached in the last fiscal year.

- 1
- 2-4
- 5-9
- 10-19
- 20-49
- 50-199
- >200

18. Rank EACH variable below in terms of the magnitude of the challenge that it represents for the ORGANIC food processing part of your business., with 1 being the most challenging and 11 being the least challenging. Use each number only once and choose N/A if the issue is not relevant to your business.

- Complying with organic standards
- Sourcing organic ingredients
- Maintaining organic quality control
- High cost of organic ingredients
- Finding appropriate processing technology/equipment
- Finding appropriate expertise
- Finding markets
- Sourcing ingredients close to the processing facility
- Buyers unwilling to pay what my business needs to achieve profitability
- Cost of distribution is too high
- Lack of capital to expand in order to access new markets

19. Has your business ever experienced signficant challenges related to the Canadian Organic Standard (COS)?

20. If you answered yes to Q.19, how has or is your business overcoming challenges related to the COS?

21. Has your business ever experienced significant callenges in sourcing organic ingredients for one or more ORGANIC foods?

22. If you answered yes to Q.21, how has your business dealt with this challenge?

23. Taking into account all the ingredients for all of your ORGANIC food products, choose the option below that best describes where the ingredients are sourced.

- 100% of all ingredients in all of our organic products are Canadian

>75% of all ingredients in all of our organic products areCanadian
50-74% of all ingredients in all of our organic products are Canadian
<49% of all ingredients in all of our organic products are Canadian

24. We source some of our organic ingredients from (check all the options below that apply):
- The U.S. or Mexico
- Central of South America
- Europe
- Asia

25. We can source all of our required ingredients, but would prefer to find a source that is closer to the manufacturing facility.
- Agree
- Disagree

26. We have been able to source the organic ingredients that we need, but they are too expensive to enable us to manufacture an economically viable product.
- Agree
- Disagree

27. Choose ALL the options below that reflect how your business sources its ORGANIC ingredients.
- We source some ingredients directly from organic farms
- We source some ingredients from distributors
- We source some ingredients from brokers
- We source some ingredients from other food processors

28. What methods does your company use to increase its supply of organic ingredients? Check all options that apply.
- We have expanded the geographic area in which we source ingredients
- We work with existing organic suppliers to help them scale up their production
- We don't have a problem sourcing organic ingredients

29. We have NOT been able to source all the ingredients that we need in organic form for a particular product and have therefore decided not to manufacture a particular product, at least not for now.
- Agree
- Disagree

30. We are able to source ALL the ingredients for our ORGANIC food products in natural (i.e. not synthesized in a lab) form.
- Agree
- Disagree

31. Are any of the following food additives or processing aids used in any of your business's ORGANIC food products? Check all options from the list below that apply.
- Preservatives
- Food colourants
- Anti-caking agents
- Emulsifiers
- Raising agents
- Anti-oxidants
- Flavours or flavour enhancers
- Fining agents
- Other (specify)

32. Does your business test some or all of its ORGANIC INGREDIENTS for:
- Genetically modified organisms
- Pesticides

33. If you answered NO to all or part of Q.32, choose the option below that best explains why your business does not do the testing.

34. My business has been able to source appropriate packaging or packaging materials to meet the requirements and principles of the Canadian Organic Standard.
- Agree
- Disagree

35. Does your business use innovative packaging materials to decrease the environmental footprint of your products?

36. If you answered yes to Q.35, please detail how your packaging or packaging materials reduce the product's environmental footprint relative to that of its competitors.

37. Has your business been able to find scale-appropriate food processing equipment that meet the principles and practices of the Canadian Organic Standard?

38. If you answered yes to Q.37, please indicate the country from which you sourced the equipment.

39. If you answered no to Q.37, please provide some detail on the type of equipment that you need but cannot find.

40. Has your business been able to find appropriate technical advice to develop your ORGANIC food products?

41. If you answered no to Q.40, please detail the type of information you need, but cannot find.

42. Select the option from the list below that best describes your business's current situation.

- We're happy with our current markets
- We don't have the markets we need. We want to expand our markets
- We have the markets we need, but buyers are not willing to pay the price we need
- Other (specify)

43. What is the biggest challenge that your business faces in terms of marketing its ORGANIC food products?

44. From what sources does your business's principle ORGANIC food products face the most competition?

- Other Canadian processed food products
- Products imported from the U.S.
- Products imported from Mexico
- Products imported from other foreign destin ations

45. Please rank EACH of the following attributes based on the degree to which they distinguish your ORGANIC food products from the competition and are essential to their success in the marketplacem with 1 being the most important and 12 being the least important. Choose N/A for attributes that are not relevant to your business.

- Gourmet
- Local
- Quick/easy to prepare
- Healthy/nutritious
- Vegan
- Vegetarian
- Organic
- Fair Trade
- Gluten-free
- Kosher
- Halal
- Allergen-free

46. I have been able to find a distributor and or storage facility that meets my needs as and organic food processor.

- Agree
- Disagree

47. Did your business commission/conduct any research and development activities during the last three fiscal years?

48. If you answered yes to Q.47, what percentage of your business's gross revenue did you invest?

49. In your opinion, what activity, research/development project should the organic sector focus on in order to best promote the development of the Canadian organic food processing sector?

50. Please detail any other challenges that your business has experienced in processing ORGANIC foods that have not already been covered by this survey.

## Appendix 4 Details on key data sources

### Nielsen

The Canada Organic Trade Association commissioned a study from Nielsen (COTA 2017b) to provide detailed sales data on packaged and fresh organic food sales. The data covers 40 grocery banners, drug stores and mass merchandisers across Canada during a 52 week period ending July 22, 2017. Nielsen does not collect data from all mainstream retailers. For example, sales from Costco Wholesale, one of the largest mass merchandisers in Canada, were not included. Natural Food Stores are also not included. For this reason, a Retail Channel Adjustment was included to provide an estimate of total organic mainstream retail. Nielsen used a UPC codes that were compiled by COTA.

### Mintel Global New Product Database

This database monitors global food product launches. Records are assigned a 'launch type'. Products are considered as **new products** when a new range, line, or family of products is encountered in the brand field. Each countries brand activity is considered independently, so if brand activity that exists for one country in the database is introduced to a new country, it is considered as a new product in the new country. **N**ew variety/Range extensions are new extensions to an existing range of products on the GNPD. New packaging is tracked visually or when the terms 'new look', 'new packaging' or 'new size' appear on the package. New formulation is tracked when terms such as 'new formula', 'even better', 'tastier', 'new and improved', or 'great new taste' appear on the package. Relaunch is tracked when specified on the packaging or via a secondary source of informatio such as PR or website indicates a product reformulation

### Euromonitor Passport

This report relied heavily on sales and market share data available in the Euromonitor Passport database for food sold at retail. The database relies on the regional knowledge of analysts in 12 offices around the globe using publicly available data.

### Statistics Canada Harmonized Commodity Description and Coding System (HS) codes

HS codes are an internationally standardized system of names and numbers used to track the flow of trade across countries. The system relies on exporters to use the appropriate code to describe products trade across international boundaries allowing countries to track both the volume and value of trade. There are hundreds of HS codes for food products, but only recently has Canada added specific codes for organic imports and exports. There are still only a handful of HS codes for organic foods and importers and exporters will often use the conventional codes even if organic codes are available. HS codes on foods are tracked by Statistics Canada and aggregated by Agriculture and Agri-Food Canada on a regular basis.