Guide to the Canadian Organic Standards 2026

PART 2 - Guide 311 - Permitted Substance Lists

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Preface

To label a product with the Canada Organic logo, producers are required, by law, to follow the Canadian Organic Standards. These apply whether you are growing vegetables, raising laying hens or processing convenience food. The standards, however, can be challenging to read, but it is critical that producers understand these documents. That's where The Guide to the Canadian Organic Standards comes in. Our goal is to help readers understand the standards. We explain what the standards mean and the reasoning behind them. Sometimes, we provide background information; other times, we give examples that are relevant to producers and help operators applying the standards.

Throughout the guide, we provide excerpts from the Canadian Organic Standards adjacent to our interpretation and guidance. Note that to understand the standards fully, readers should consult the entire standards. The most current editions can be found at: https://inspection.canada.ca/en/food-labels/organic-products/standards.

The 2026 Canadian Organic Standards come into force in March 2026, however current farmers, processors and other operators have a grace period of one year to adapt their practices to meet the new standard.

The guide includes the interpretation of the standards by the Organic Standards Interpretation Committee (SIC), which is overseen by the Organic Federation of Canada in partnership with the Canadian Food Inspection Agency. A link is provided in the footer of each page so readers can learn more about the Canadian Organic Standards by reading Q&As. The questions are submitted by the public and the SIC's answers are binding.

We hope *The Guide to the Canadian Organic Standards* will help Canadians understand the standards. Our goal is to help enable farmers, ranchers, processors and other producers to adapt their practices so their products can be certified as organic to the national standard. For consumers, the guide can explain how organic products differ from non-organic, and thereby highlight the value of choosing organic products.

For more information, contact Canadian Organic Growers at cog.ca or the Organic Federation of Canada at organicfederation.ca

Janet Wallace
Editor

Acknowledgements

THE GUIDE TO THE CANADIAN ORGANIC STANDARDS
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Published April 2026 by Canadian Organic Growers.
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Many individuals contributed to the past versions of the guide. The key writers for past issues include Anne Macey, Rochelle Eisen and Janet Wallace.

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The methods and opinions expressed in this publication are not necessarily those of Canadian Organic Growers Inc. or the Organic Federation of Canada. Use of any products or methods mentioned in this book cannot be a guarantee that an operation will meet certification standards or that they will work on a particular farm. It is the responsibility of the organic farmer to ensure that any methods used meet Organic Standards of the export destination country.

Guide to the Guide

The Guide includes two documents:

- Part 1 - Guide to Organic Principles and Management Standards—CAN/CGSB-32.310
- Part 2 - Guide to Lists of Permitted Substances—CAN/CGSB-32.311.

In the left-hand column, you will find the wording of the 2026 Canadian Organic Standards. The right-hand column contains our guidance, including explanations, examples and clarifications regarding prescribed practices and permitted substances.

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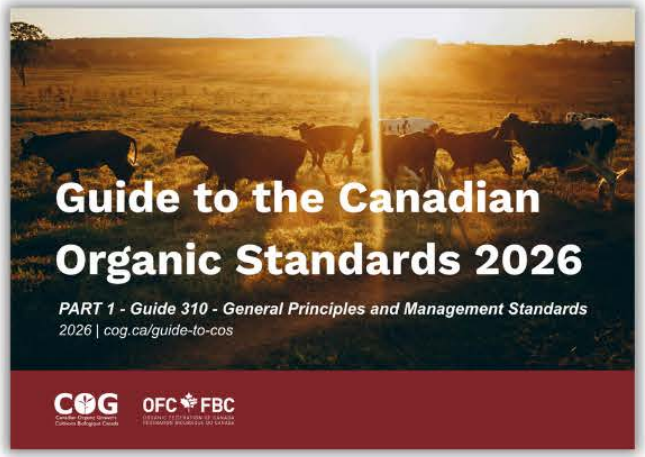

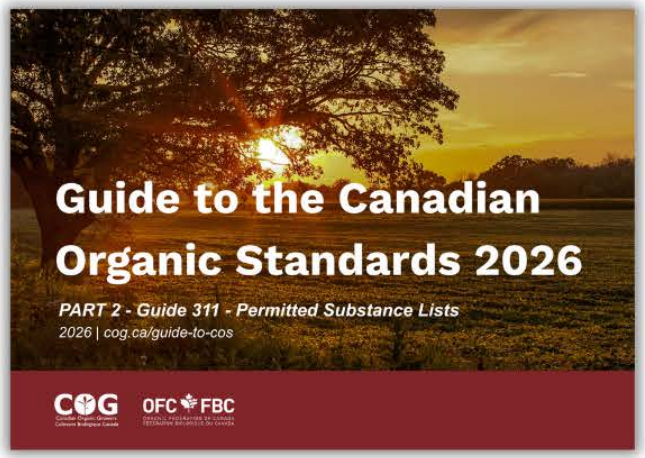

0. Introduction

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0. Introduction

	2026 Canadian Organic Standards
0.1	**Description** Organic production is a holistic system designed to optimize the productivity and fitness of diverse communities within the agro-ecosystem, including soil organisms, plants, livestock and people. The principal goal of organic production is to develop operations that are sustainable and harmonious with the environment. CAN/CGSB-32.310, Organic Production Systems – General Principles and Management Standards, describes the principles and management standard of organic production systems. CAN/CGSB-32.311, Organic Production Systems – Permitted Substances Lists, provides lists of substances that are allowed for use in organic production systems. As is the case for all products sold in Canada, organic inputs—such as, but not limited to, fertilizers, feed supplements, pesticides, soil amendments, veterinary treatments, processing additives or aids, sanitizing and cleaning material—and products of organic agriculture, such as, but not limited to, feed and food, should comply with all applicable regulatory requirements.
0.2	**General principles of organic production** Organic Agriculture is based on the following general principles: Principle of health – Organic agriculture should sustain and enhance the health of soil, plants, animals, humans and the planet as one and indivisible. Principle of ecology – Organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them. Principle of care – Organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment. Principle of fairness – Organic agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.
0.3	**Organic practices**

	2026 Canadian Organic Standards
	Neither this standard nor organic products produced in accordance with this standard represent specific claims about the healthiness, safety and nutrition of such organic products. Management methods are carefully selected in order to restore and then sustain ecological stability within the operation and the surrounding environment. Soil fertility is maintained and enhanced by promoting optimal biological activity within the soil and conservation of soil resources. Pests, including insects, weeds and diseases, are managed using biological and mechanical control methods, and cultural practices that include minimized tillage, crop selection and rotation, recycling of plant and animal residues, water management, augmentation of beneficial insects to encourage a balanced predator–prey relationship, the promotion of biological diversity and ecologically based pest management. Under a system of organic production, livestock are provided with living conditions and space allowances appropriate to their behavioural requirements and organically produced feed. These practices strive to minimize stress, promote good health and prevent disease. Organic products are produced and processed under a system that strives to preserve the integrity of the principles in this standard. Organic practices and this standard cannot ensure that organic products are entirely free of residues of substances prohibited by this standard and of other contaminants, since exposure to such compounds from the atmosphere, soil, ground water and other sources may be beyond the control of the operator. The practices permitted by this standard are designed to ensure the least possible residues at the lowest possible levels. In the development of the standard, it was recognized that differences between Canada's agricultural regions require varying practices to meet production needs. This standard is intended for certification and regulation to prevent deceptive practices in the marketplace. The certification process assesses operational compliance. Certification is granted to compliant products. Certification bodies must allow a period of up to 12 months after the publication date of an amendment to this standard and to CAN/CGSB-32.311 for an applicant to come into compliance with any changes to the requirements.
0.4	**Notes and examples in this standard** In this standard, notes and examples are used for giving additional information intended to assist the understanding or use of the document and are not a normative part of the standard.

1. Scope

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1. Scope

	2026 Canadian Organic Standards
1	**Scope**
1.1	This National Standard of Canada provides additional information to CAN/CGSB-32.310, Organic Production Systems—General Principles and Management Standards, by specifying the substances permitted for use as described in the annotations, in accordance with the scope of the table in which they are classified. The use of a substance in a manner inconsistent with the functions defined in the table in which it appears is not permitted, except as provided for in the annotation specific to that substance. The listed substances must comply with the prohibitions set out in 1.4 and 1.5 of CAN/CGSB-32.310.
1.3	**Units of measure** Quantities and dimensions in this standard are given in metric units with yard/pound equivalents, mostly obtained through soft conversion, given in parentheses. The metric units shall be regarded as being official in the event of dispute or unforeseen difficulty arising from the conversion.

2. Normative References

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2. Normative References

	2026 Canadian Organic Standards
2	**Normative references** The following normative documents contain provisions that, through reference in this text, constitute provisions of this National Standard of Canada. The referenced documents may be obtained from the sources noted below.
NOTE	The addresses provided below were valid at the date of publication of this standard. An undated reference is to the latest edition or revision of the reference or document in question, unless otherwise specified by the authority applying this standard. A dated reference is to the specified revision or edition of the reference or document in question.
2.1	**Canadian General Standards Board (CGSB)**
	CAN/CGSB-32.310 — Organic Production Systems — General Principles and Management Standards.
2.1.1	**Source**
	The above may be obtained from the Canadian General Standards Board, Sales Centre, Ottawa, ON Canada K1A 0S5. Telephone: 1-800-665-2472. E-mail: ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca. Web site: www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html.
2.2	**Canadian Council of Ministers of the Environment (CCME)**
	Compost Quality Guidelines.
2.2.1	**Source**
	The above-mentioned document is available from the Canadian Council of Ministers of the Environment, 123 Main Street, Suite 360, Winnipeg, Manitoba R3C 1A3. Phone: 204-948-2090. Fax: 204-948-2125. Email: info@ccme.ca. Website: www.ccme.ca.

	2026 Canadian Organic Standards
2.3	**Quebec Standards Bureau (QSB)**
	CAN/BNQ-0017-088 — Spécifications pour les plastiques compostables.
2.3.1	**Source**
	The document mentioned above is available on the BNQ website at: www.bnq.qc.ca
2.4	**Demeter Production Standards**
	Demeter Production Standards
2.4.1	**Source**
	The documents mentioned above can be obtained from the Demeter Production website at: https://demeter.net/wp-content/uploads/2025/11/2026_Int_Dem_bio_Standard_eng.pdf
2.5	**Pest Management Regulatory Agency (PMRA)**
	List of formulation products from the Pest Management Regulatory Agency (PMRA).
2.5.1	**Source**
	The publication mentioned above is available on the PMRA website: https://open.canada.ca/data/en/dataset/ededff77-a021-48d6-89a5-cdbcd75fb4ff
2.6	**Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks (MELCCFP)**
	Guide to Recycling Fertilizer Residues
2.6.1	**Source**

	2026 Canadian Organic Standards
	The publication mentioned above is available on the MELCCFP website at http://www.environnement.gouv.qc.ca/matieres/mat_res/fertilisantes/critere/guide-mrf.pdf
2.7	**Organisation for Economic Cooperation and Development (OECD)**
	OECD Guidelines for the Testing of Chemicals, Section 3: Degradation and Accumulation.
2.7.1	**Source**
	The document is available on the OECD website: https://www.oecd-ilibrary.org/

3. Requirements for Adding or Amending Substances in the Lists

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3. Requirements for Adding or Amending Substances in the Lists

2026 Canadian Organic Standards
Section 10 of the CAN/CGSB-32.310 standard describes the requirements for adding or modifying listed substances.

4. Permitted Substances Lists for Crop Production

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Organic production systems - Permitted Substances Lists

4. Permitted Substances Lists for Crop Production

		Guidance
4.1	**Classification**	
4.1.1	Crop production substances are classified according to the following uses and applications: Soil amendments and crop nutrition in Table 4.2 (Column 1) are substances applied to the soil to improve fertility, tilth and soil biodiversity. Fertilizers, plant foods and soil amendments are primarily used for their plant nutrient content and may be applied to the soil or to plant foliage. Soil building practices and nutrient usage shall comply with section 5.4 of CAN/CGSB-32.310. Crop production aids and materials in Table 4.2 (Column 2) may be directly applied to the crop or soil, or used to control pests (including diseases, weeds and insects) when organic management practices alone cannot prevent or control pests as specified in section 5.6.2 of CAN/CGSB-32.310. Examples include: adjuvants, insect traps and plastic mulch, vertebrate animal pest management substances, plant disease and insect pest management substances.	The Permitted Substances Lists (PSL), CAN/CGSB-32.311, authorize the use of substances that are considered necessary for organic production. The list pertaining specifically to crop production is Table 4.2 Soil Amendments and Crop Nutrients & Crop Production Aids and Materials. Substances that can be used as soil amendments, fertilizers or other sources of crop nutrients have a dot in Column 1. Substances that can be used as crop production aids and materials (such as substances for pest control, seed cleaning, wetting agents, etc. have a dot in Column 2. The lists are in alphabetical order using common names for substances. Minerals are generally clustered under the name of the mineral. For example, under the substance name “Potassium,” you will find langbeinite, potassium chloride and potassium sulphate. The PSL does not list products, but rather substances. Products are commercial formulations which are available on the market (brand name products). Producers are cautioned that commercial formulations often contain formulants in addition to the active ingredient. For example, formulants may be added to stabilize, preserve or improve the flowability of the active ingredient.
4.1.1 a		
4.1.1 b		

		Guidance
		Products can combine substances from the two columns which perform different functions, such as a fertilizer and a pest control substance. For example, boron (a fertilizer) and *Bacillus subtilis* can be applied together at planting time. Boron is listed in Table 4.2 (Column 1) as a soil amendment. *B. subtilis* is included under the general heading Microorganisms and microbial products in Table 4.2 (Column 2). It is used for disease control (the bacteria can outcompete fungi on the surface of the seed). Each component is subject to the specific requirements of the column and the annotations. Regarding *B. subtilitis*, microorganisms are subject to 1.4 of CAN/CGSB-32.310 and cannot be genetically engineered or grown in a GE substrate unless a non-GE substrate product is not commercially available. Producers should take note of any restrictions regarding the acceptable origin, non-GE status, and requirements to document the need for a particular substance. Even if there is no specific mention of the GE prohibition in the annotation, GE substances are prohibited. *See* 4.1.3 below. For certain substances, there are requirements to demonstrate that the substance will not cause a build-up of heavy metals or salts in the soil. Soil testing may be required to document levels of such substances. Substances which have been certified as organic do not need to be on the Permitted Substances List to be used on organic operations. However, farmers and operators are required to report the use of all substances and in the case of certified organic products, obtain a copy of its organic certificate. Occasionally, organic substances are listed as permitted to provide specific direction on how they may be used. Any product that bears the logo of the

		Guidance
		Canadian Organic Regulation is allowed even if it is not on the Permitted Substances List. Production inputs which are certified to the National Organic Program in the U.S. can only be used in Canada if they comply with the Canada/U.S. Equivalency Agreement which addresses differences between the Canadian and U.S. organic systems. For example, seeds which have been grown in the U.S. in soil that has been amended with Chilean nitrate is not considered organic in Canada because Canada does not allow Chilean nitrate. Operators are reminded to refer to CAN/CGSB-32.310 General Principles and Management Standards. They are also reminded that soil building is the foundation of organic production and that management practices should be the basis of pest control and the first approach. Production aids are permitted only when management practices alone cannot control pests.
4.1.2	Use of a listed substance in a manner inconsistent with the scope of the table in which it appears is not permitted, except as specified in substance annotations.	If a substance is allowed in one context in the PSL, that does not mean it is allowed to be used in another way. An annotation in one part of the PSL which allows the use of a substance does not affect its usage under another part of the standard. As stated in the introduction of CAN/CGSB-32.311-2015, organic operations are required to abide by all other federal legislation. Before using a product, its use should be approved by the certifier.
4.1.3	Substances listed in Table 4.2 shall comply with prohibitions in 1.4 and 1.5 of CAN/CGSB-32.310. The following additional requirements apply to substances produced on substrates or growth media (for example, microorganisms and gibberellic acid):	Prior to 2015, genetic engineering of microorganisms was not common; only GE vaccines were identified in the standards. In the current version, the GE prohibition has been extended to include all products of biofermentation.
4.1.3 a	if the substance includes the substrates or growth media, the ingredients	Many substances that we take for granted (such as amino acids, vitamins,

		Guidance
	of the substrates or growth media shall be listed in Table 4.2;	flavours, enzymes, xanthan, natamycin, lysozyme, aspartame and chymosin) are now manufactured by genetically engineered microorganisms. Producers are required to provide documentation that confirms that the microorganism used to produce the substance was not genetically engineered. Agar agar used to be the medium of choice for biofermentation but has been replaced almost entirely with a soy agar, most often produced from GE soybeans. Sugars are added to the biofermentation vats to feed the microorganisms and are primarily supplied by GE corn. The standard requires farmers and operators to search for a product produced on a non-GE substrate. If such a product cannot be found, the product produced on or in a GE substrate can be used.
4.1.3 b	if the substance does not include the substrates or growth media, the substance shall be produced on non-genetically engineered substrates or growth media, if commercially available.	

Table 4.2 - Substances for Crop Production

Table 4.2 - Substances for crop production. Column 1: Soil amendments and crop nutrition, Column 2: Crop production aids and materials.

Substance name(s)	Origin and usage	1	2	Guidance
Acetic acid	Sources other than petrochemicals can be used. As an adjuvant, a pH regulator and for controlling pests (including weeds) and cleaning seeds.		✓	Acetic acid and vinegar are terms which are used interchangeably until the percentage of acetic acid in a product reaches 8%. At that point it is usually referred to as acetic acid. Permitted sources include acetic acid produced through fermentation, but not through methanol carbonylation, acetaldehyde oxidation or ethylene oxidation. *Acetobacter* is a microorganism capable of producing up to 20% acetic acid through biofermentation. Operators are required to provide documentation stating that the bacteria used to manufacture acetic acid are not genetically engineered (GE). Operators must search for products that were not made on a GE substrate. However, operators can use products made with GE plant materials (such as GE corn or soybeans) as the substrate if there are no commercially available alternatives and the substrate does not remain in the final substance.
Adhesives for sticky traps and barriers			✓	Trapping pest insects or disease spores using sticky traps can be effective in greenhouses and in the field. In the field, sticky traps are used primarily to monitor the pest population level and determine when additional pest control measures need to be employed. Adhesives used in sticky traps are not restricted.
Agar	For use in initial mushroom spawn production.	✓		Extracted from red algae, agar is a gelatinous substance used as a substrate on which microbial cultures are grown. Any algal source of agar is allowed. Soy agar (TSA) has replaced agar agar in many applications.

Substance name(s)	Origin and usage	1	2	Guidance
				For soy agar to be used, a non-GE affidavit needs to be obtained.
Alfalfa meal and pellets	Shall be organic if commercially available.	✓		Commercial availability is defined as: "The documented ability to obtain a production input or an ingredient in an appropriate form, quality, quantity or variety, irrespective of cost, in order to fulfill an essential function in organic production or preparation." When a product is required to be organic "if commercially available," a search for the organic form must be conducted. The failure to find an organic source must be recorded before using a non-organic version of the input. Record the known sources of the organic input and the reason for not using it. Cost is not a permitted reason for rejecting the organic version. If an organic product or seed cannot be imported into Canada due to import restrictions, it would be considered to be unavailable commercially.
Algae and algal products	*See* Table 4.2 Aquatic plant extracts and Plant material.	✓	✓	
~~**Amino acids**~~		✓	✓	"Amino acids" has been replaced with two listings: "Hydrolyzed proteins of plant origin" and "Hydrolyzed proteins of animal origin".
Ammonium carbonate	As an attractant in insect traps.		✓	This substance is known as smelling salts and can be used as a lure in insect traps.
Animal manure, unprocessed	Includes solid manure (manure mixed with bedding), liquid manure and slurry. Manure sources shall comply with the requirements specified in subclauses 5.4.2 b) 3) and 5.5.1 of CAN/CGSB-32.310. Usage shall comply with subclause 5.5.2.5.	✓		Animal manure can be a valuable source of nutrients for an organic farm. Manure is usually composted before applying to the soil. Most of the microorganisms than can cause disease in humans (or in other animals or plants) are killed by thorough composting, in which all parts of the compost pile or windrow reach a temperature 55°C (130°F) for at least four days (*see* Compost produced on the farm in PSL Table 4.2).

Substance name(s)	Origin and usage	1	2	Guidance
	Concentrated nutrient extracts, such as those produced by distillation, are not considered to be animal manure.			If manure is not composted as described above, it is subject to the same restrictions as raw manure as outlined in 5.5.2.5 in the Standard. For example, raw, liquid or partially composted manure has to be incorporated into the soil at least 120 days before harvesting crops that have edible parts that may touch the soil, such as salad greens or tomatoes and at least 70 days before the harvest of crop products that do not come into contact with the soil and are intended for human consumption. In 2026, "Animal manure" was changed to "Animal manure, unprocessed" for clarity. The annotation prohibits concentrated nutrient extracts to clarify that these substances, even those derived from unprocessed liquid manure or slurry, are not considered animal manure.
Animal manure, dried	Dried manure may be pelleted or granulated. The operator shall be able to demonstrate that best practices known to eliminate human pathogens have been used in the production process; OR demonstrate that the product meets criteria for acceptable levels (MPN/g total solids) of human pathogens as specified in Guidelines for Compost Quality; OR follow the application restrictions in subclause 5.5.2.5 of CAN/CGSB-32.310. *See* also Compost and Digestate, anaerobic, for microbially treated manure.	✓		The most common processing method is to dehydrate and extrude the manure into pellets or granules. Dehydration and pelleting at 82C is sufficient to eliminate common pathogens. Pellets may contain other ingredients, such as binders and emulsifiers which can only be used if the additional ingredients are listed on Table 4.2 (Column 1). Documentation of the additives will be required. Often manufacturers will not share their secret recipes unless they can obtain a confidentiality agreement in exchange. Such agreements are commonly made with certifiers. Always check with your certifier before using a commercial product. In 2026, "Animal manure, processed" was changed to "Animal manure, dried" for clarity. The annotation outlines the requirements for managing the risk of potential human pathogens in dried manure.
Aquatic plant extracts	Aquatic plant extracts may be produced using the following substances in order of preference:	✓	✓	Aquatic plant extracts can supply minerals, micronutrients, vitamins and other substances that can promote plant growth. They are used to

Substance name(s)	Origin and usage	1	2	Guidance
	a) substances in Table 4.2 (Column 1 or 2) with the exception of Formulants used in Crop Production Aids; b) potassium hydroxide provided that the amount of solvent used does not exceed the amount necessary for extraction. The operator shall provide an affidavit from the manufacturer that proves the need to use potassium hydroxide; c) potassium sorbate; and d) sodium benzoate. Aquatic plant extracts shall not contain more than: a) 1.5% total nitrogen (dry basis); b) 0.5% P2O5 (dry basis); and c) 20% K2O (dry basis). Ammonium nitrogen shall not exceed 20% of total nitrogen (dry basis). Nitrate-nitrogen shall not exceed 20% of total nitrogen (dry basis). Nitrogen compounds may not be added during the extraction process. *See* Table 4.2 Plant material listing for use of unprocessed aquatic plants.			supplement the nutrients in the soil or potting mix. However, most of the nutrients for the crop should come from the soil, not concentrated soil amendments. In 2020, the substance was listed as “Aquatic plants and aquatic plant products.” In 2026, this was changed to a new listing for aquatic plant extracts only while aquatic plant material falls under the new "Plant material" listing. Sodium hydroxide (in b) is no longer permitted as an extractant because it is caustic, not commonly used, and its removal should not impact the sector. The other preservatives are permitted because water-extracted products would be unstable without them. The maximum nutrient levels reflect the estimated nutrient content in unadulterated aquatic plant products. The new testable criteria (e.g., maximum levels of N, P, K) serve as a tool for assessing compliance and preventing undeclared substances/fraudulent products, thereby ensuring organic integrity.
Ascorbic acid (vitamin C)			✓	Both synthetic and non-synthetic forms are permitted.
Ash	Ash shall be from plant and animal sources. Ash from burning manure or from burning minerals, coloured paper, plastics or other non-biological substances is prohibited. Ash containing materials that cannot be verified or containing prohibited substances shall not	✓	✓	Hardwood ash is recognized as a valuable soil amendment which can provide up to 40% of the value of calcitic lime in raising the pH. Ash also contains potassium and phosphorus. If you use ash from your woodstove, it is important to document that you

Substance name(s)	Origin and usage	1	2	Guidance
	exceed the limits (category C1) for acceptable levels (mg/kg) of arsenic, cadmium, chromium, lead and mercury, as specified in *Guidelines for the Beneficial Use of Fertilizing Residuals.* Shall not cause a build-up of heavy metals or micronutrients in soil.			do not burn coloured paper, plastics or anything other than plain paper and untreated wood. If farmers obtain ash produced from unverifiable materials, such as forest waste burners, they will require an affidavit from the forestry company verifying that the wood waste has not been treated. Otherwise, test results will be needed to confirm that the ash does not contain levels of arsenic, cadmium, chromium, lead or mercury that exceed the maximum allowable levels as specified in the Composting from off-farm sources annotation.
Baits for rodent traps	May contain food or substances listed in Table 8.1.		✓	
Bentonite	*See* Table 4.2 Mined minerals, unprocessed and clay.	✓	✓	Bentonite is a form of clay which can be applied as a light coating on leaves to discourage insect pests.
Biochar	Produced through pyrolysis of forestry by-products which have not been treated or combined with prohibited substances. Recycled biochar from contaminated remediation sites is prohibited.	✓		Biochar is an extremely durable form of charcoal. It takes up nutrients in soils, holds them and releases them over a long period of time. For this reason, biochar can be used as a soil amendment to rapidly improve soils that are low in carbon. It cannot be used as a soil substitute in containerized greenhouse production systems because it does not meet the requirements of a soil/growth media (32.310 7.5.2.1). Biochar, sometimes called greenchar, is also used to remove toxins from contaminated sites. The toxins bind to the biochar molecules and are slowly released back into the environment over time. To avoid introducing heavy metals, dioxins and other toxic substances to the soil, biochar may only be used if it is from untreated sources.
Biodegradable plant containers	Biodegradable planting containers (for example, biobased pots or cell packs and paper chain pots) may		✓	Planting containers containing Kraft lignin can be left to decompose in soil if all their ingredients are listed in Table 4.2 Column 1. However,

Substance name(s)	Origin and usage	1	2	Guidance
	be left to decompose in the field if all ingredients, including adhesives, are listed in Table 4.2 (Column 1). Paper-based plant containers may contain incidental formulants included in PMRA lists 4A and 4B. *See* definition of "Biodegradable."			biodegradable plant containers that contain ingredients not listed in Table 4.2 Column 1, such as waxes and glues, must be removed when the transplant is set in the soil. Such containers can be reused, added to compost or disposed of through a municipal waste program. Paper chain pots are paper-based transplanting aids that are not necessarily 100% bio-based. They may contain synthetic ingredients and therefore cannot be left to decompose in the soil. The use of chain pots is permitted, albeit implicitly, under this listing but only if they are removed after use.
Biodynamic preparations for compost, soil and plants	As described in the international *Demeter Biodynamic Production Standards.*	✓	✓	Biodynamic preparations can be added to compost or soil, or applied to plants provided they contain only recognized ingredients of biodynamic preparations. For more information, refer to the *Demeter Biodynamic Production Standards*.
~~"Biological organisms"~~		✓	✓	This listing has been eliminated because it is now redundant. The dead organisms that had been included in this listing are addressed under the new Microbial extracts listing, while other organisms and beneficial insects are covered by the Invertebrates listing.
Blood meal	Shall be sterilized.	✓		Blood meal is dried, powdered blood obtained from slaughterhouses and used in agriculture as a high-nitrogen fertilizer. It is one of the most potent biological sources of nitrogen; if too much is used, it can burn plants with excessive ammonia. As with other sources of plant-available nitrogen, it can also lead to excessive weed growth and problems with insect pests, such as aphids. To make blood meal, whole blood is centrifuged to remove foreign material and then spray-dried to give it a free-flowing consistency. Commercial manufacturing of blood meal requires a heating/drying phase to meet the definition of sterilization.

Substance name(s)	Origin and usage	1	2	Guidance
Bone meal	Shall be guaranteed free of Specified Risk Material (SRM).	✓		Any bone meal or blood meal marketed in Canada must comply with CFIA's Fertilizer Regulations. This restriction on the use of Specified Risk Material (SRM), such as the brain and spinal cords from cattle, is designed to protect Canadian farms from the spread of Bovine Spongiform Encephalopathy, also known as BSE or Mad Cow Disease.
Borate (boric acid)	Mined sources of sodium tetraborate and octaborate are permitted as wood preservatives. Permitted for structural pest control (example: for ants). Direct contact with organic food or crops is prohibited in the case of products formulated as pesticides.		✓	Boric acid is a mild acid used as an insecticide, mostly indoors, such as controlling ants in warehouses. Boric acid cannot be used directly on, or even touch, organic crops or foods. It is produced mainly from borate minerals by a reaction with sulphuric acid.
Boron	Borates including hydrated borates of sodium (octaborate, pentaborate, tetraborate, borax), boric acid, and boron-lignosulphonate complexes (except those containing ammonium lignosulphonate) are permitted when soil and plant deficiencies are documented by visual symptoms or by testing soil or plant tissue, or when the need for a preventative application can be documented. May be chelated with substances listed under Table 4.2 Chelates. Ammonium borates, boron-amino acid and boron potassium nitrate mixes (BKNO3) are not permitted.	✓		Boron is an essential micronutrient which may be present in the soil at sufficient levels but not available to plants because of certain conditions (such as dry, sandy or alkaline soils). Also, certain soils are naturally low in boron. Soil or tissue testing or documents showing other signs of deficiency (such as records of visual symptoms) is recommended prior to the use of boron or other micronutrients to ensure that applications will not result in a damaging oversupply in the soil. Once an excess of boron has been created, it is very difficult to correct. Boron can be applied to prevent boron deficiencies in boron-demanding crops, such as beets, cabbage family plants and alfalfa, based on agronomic documents, such as production guides.
Botanical pesticides	Botanical pesticides shall be used in conjunction with a biorational pest management program. They shall not be the primary method of pest control. The least toxic		✓	Pyrethrum is an example of a pesticide derived from plants. A 'biorational' plan to prevent pests is required before any pest control product can be used. The term 'biorational' refers to a prevention plan which uses the

Substance name(s)	Origin and usage	1	2	Guidance
	botanicals shall be used in the least ecologically disruptive way possible. All label restrictions and directions shall be followed, including restrictions concerning crops, livestock, target pests, safety precautions, pre-harvest intervals and worker re-entry.			least toxic form of pest control. Pest prevention plans include crop rotation, cover cropping, companion planting, a balanced nutrient management plan, and other crop management practices which reduce the need for reliance on pesticides. Even pesticides which are permitted have the potential to harm some beneficial organisms which help control pests. Formulants used with botanical pesticides shall comply with requirements in Table 4.2 *Formulants used in crop production aids*. A registered botanical pesticide can only be used for the purposes permitted by the registration and using the prescribed methods outlined on the label. For example, although rotenone is a botanical pesticide, it cannot be used for organic production in Canada, because rotenone products are no longer registered for agricultural use in Canada.
Brewers' grains and solubles	A by-product or by-products from the production of alcohol by fermenting grain. Shall be from non-GE grain. Shall not contain more than 7% total nitrogen (dry basis). Ammonium nitrogen shall not exceed 15% of the total nitrogen (dry basis). Nitrate nitrogen shall not exceed 10% of the total nitrogen (dry basis). Nitrogen compounds, beyond what is needed for yeast nutrition, may not be added during the fermentation process and they may not be added post fermentation.	✓		The listings for Distillers' grains and solubles and Brewers' grains replace the more general listing for Stillage and stillage extract. The annotation indicates acceptable sources, the source and the restriction of GE-grains. The maximum nutrient levels reflect the expected nutrient levels if the substance is unadulterated. These limits serve as criteria to prevent the use of undeclared substances/fraudulent products, thereby ensuring organic integrity.

Substance name(s)	Origin and usage	1	2	Guidance
Calcium	Calcium carbonate (calcitic limestone), calcium magnesium carbonate (dolomitic limestone), calcium silicate, and calcium sulphate (gypsum), all from mined sources. Other biological or mineral sources, such as shells from aquatic animals (for example, oyster shell flour), aragonite, eggshell meal and lime from sugar processing. Calcium chloride derived from naturally occurring brines. May be chelated with substances listed under Table 4.2 Chelates. Prohibited forms include slaked limestone (calcium hydroxide); quicklime (calcium oxide); calcium sulphate produced using sulphuric acid and calcium products that have been used in controlled atmosphere storage. *See* Table 4.2 Calcium sulphate (gypsum) for additional restrictions on this substance.	✓		Calcium is a common mineral found worldwide and is the main component of bones, shells of marine organisms, snails and eggshells. Many forms of calcium are available; organic growers need to check the details of the Calcium listing in Table 4.2 to find out which substances are permitted and under what circumstances. Calcitic and dolomitic lime are both permitted sources and are used to raise soil pH. Calcium carbonate is the active ingredient in agricultural calcitic lime. Dolomitic lime is calcium magnesium carbonate and can be effective in amending soils low in magnesium and calcium. Slaked lime (also called hydrated lime), however, is not allowed as a soil amendment because it may have deleterious effects on soil. Calcium chloride can be used if it is from natural brines. Prohibited sources of calcium chloride are those derived from the ammonia-soda process (the Solvay process). Calcium silicate, including the mined product known as Canadian Wollastonite, improves the plant's immune system and its drought tolerance. It helps produce stronger cell walls (which discourage insect pests) and helps suppress powdery mildew. The Calcium listing was modified (regarding chelates) to ensure further scrutiny when approving products chelated with other substances listed in Table 4.2. Certain calcium products claim chelation with amino acids. Calcium chelated with hydrolyzed proteins of animal or plant origin (which replace the Amino acids listing) will only be permitted if it meets the maximum nutrient requirements of hydrolyzed proteins.
Calcium lignin sulphonate	*See* Table 4.2 Lignin and lignin sulphonates (lignosulphonates)	✓	✓	

Substance name(s)	Origin and usage	1	2	Guidance
Calcium polysulphide	*See* Table 4.2 Lime sulphur.		✓	
Calcium sulphate (gypsum)	Mined sources are allowed; calcium sulphate produced using sulphuric acid is prohibited. To correct calcium and sulphur deficiencies and soil salinity problems.	✓		Only mined sources of gypsum may be used; gypsum reclaimed from drywall may contain synthetic adhesives, fire retardants or other prohibited substances.
Cannery wastes	Shall be from organic sources. Non-organic cannery wastes shall be composted. *See* Table 4.2 Compost feedstocks.	✓		
Carbon dioxide (CO_2)	For soil and greenhouse use, for controlled atmosphere storage, and for storage pest control.		✓	Carbon dioxide is a byproduct of combustion. Plants take in carbon dioxide and exhale oxygen. Any source is allowed for use in greenhouses or controlled atmosphere storage.
Cardboard	Cardboard shall not be waxed or impregnated with fungicide or prohibited substances. For use as mulch, as composting feedstock or as pest trapping material. *See* Table 4.2 Compost feedstocks.	✓	✓	
Chelates	The following acids may be used to chelate metallic or metalloid nutrient elements listed in Table 4.2: Acetic (including vinegar), Ascorbic, Citric, Humic, Fulvic and Lignosulphonic.	✓	✓	Chelates are organic molecules that can trap highly reactive metal cations (including calcium, magnesium, cobalt, copper, zinc, iron and manganese) and make these nutrients more available to plants. The 2020 COS permitted all substances listed in Table 4.2, Column 2 to be used as chelating agents, including PMRA list 4 formulants such as

Substance name(s)	Origin and usage	1	2	Guidance
				EDTA. The 2026 annotation identifies the most common chelating agents (acids) used in fertilizers that would be approved for organic use. Amino acids were removed from the list to prevent potential misuse of micronutrient fertilizers chelated with amino acids. Chelation with amino acids results in liquid fertilizers with high levels of nitrogen (6% or more), which provides the opportunity for potential misuse as a source of liquid N (coupled with potential excess application of micronutrients). As the term 'chelate' may be unfamiliar to many, the wording, “acids may be used to chelate metallic nutrient elements” was added to emphasize that chelation is the double bonding of a metal ion with a ligand (chelating agent).
Chitosan	Including chitosan hydrochloride and chitosan oligosaccharides (COS).	✓	✓	Chitosan is made from the outer skeleton of shellfish, such as lobster and crab. The substance was added to the PSL because (1) it is a derivative of a natural product, (2) it has a low environmental impact, and (3) acts as crop protectant stimulating the plant's natural defenses and inhibiting the growth of fungi.
Cholecalciferol (vitamin D_3)	Permitted if used outdoors and inside greenhouses for rodent control when methods described in subclause 5.6.1 of CAN/CGSB-32.310 have failed. Prohibited inside on-farm food processing and food storage facilities.		✓	Cholecalciferol is a form of Vitamin D3 that is toxic to rodents as it affects the calcium and phosphate balance in their bodies. Section 8.3 (Facility Pest Management and Post-harvest Management) provides information on preventative pest control practices. If preventative practices are ineffective, products listed on Table 8.1 may be used. Section 8.3.3 allows additional products to be used provided there is no risk to the organic integrity of the products.
Citric acid			✓	Most citric acid is not made from oranges but is produced from the fungus, *Aspergillus niger. A. niger* is fed a sucrose or glucose-containing diet to produce citric acid. The source of sugar is corn steep liquor, molasses, hydrolyzed corn starch and/or other inexpensive sugary

Substance name(s)	Origin and usage	1	2	Guidance
				solutions. *A. niger* is sometimes genetically engineered to improve the efficiency of citric acid production, so it is important to ensure that your source is non-GE. Citric acid is allowed for various uses, including as a chelating agent or it can be added to a product to adjust the acidity (pH).
Clay	Bentonite, perlite and kaolin as soil amendments, as seed pellet additives or for pest control. *See* Table 4.2 Mined minerals, unprocessed; Bentonite; Kaolin clay.	✓	✓	Clay, such as bentonite or kaolin, can serve many roles on an organic farm. For example, pelleted seeds are coated with a thin layer of clay; this makes the seeds larger and easier to handle while sowing. Finely ground kaolin clay (often marketed as Surround pesticide) can be used for pest control, particularly in orchards. The fine powder can clog up the breathing tubes of insects and irritate the soft bodies of larvae. It also can repel flying insects from landing on crops. Note that care must be taken when using kaolin (or any substances that kills or repels pests); using kaolin can also kill or repel the natural predators of mites and other pests. Clay can be used as a soil amendment in sandy soil.
Cobalt	Sulphates, carbonates, oxides and chlorides of cobalt are permitted when soil deficiencies are documented by testing soil or plant tissue, or when the needs of soil microorganisms or livestock can be documented. May be chelated with substances listed under Table 4.2 Chelates. Nitrates and amino acid chelates are not permitted.	✓		Cobalt is a beneficial micronutrient and is now permitted under certain conditions as outlined in the annotation. *See also* guidance for Micronutrients.

Substance name(s)	Origin and usage	1	2	Guidance
	Shall be used with caution to prevent excessive cobalt accumulation. Cobalt build-up in soil shall prohibit future use.			
Coir (coconut fiber)	Washed, processed and/or buffered (to adjust pH) with substances listed in Table 4.2 (Column 1 or Column 2) excluding Formulants used in crop production aids.		✓	A separate listing for coir (coconut fibre) has been created because coir is an important substrate/growth medium for the organic sector and warrants its own listing. Currently the "Plant by-products and plants" listing but without specific mention, approval can be challenged since plant by-products that have been treated or produced with prohibited substances are only permitted as compost feedstocks.
Compost	Compost produced on the farm is restricted to compost produced on a certified organic farm. Compost from off-farm sources includes every other source, for example: municipal, residential or industrial sources, or from any organic or non-organic farm. *See* Table 4.2 Compost from off-farm sources; Compost produced on the farm; Compost tea; and Compost feedstocks. For information on compost starters, *see* Table 4.2 Microorganisms and microbial products. For information on vermicompost, *see* Table 4.2 Worm castings.	✓		Compost is an important tool in developing long-term soil heath as it consists of both the raw materials added to the compost pile and also the microorganisms which biodegrade the raw materials. Nutrients from compost are released over more than one season and help build humus levels and tilth in the soil. This annotation provides clarity on what is considered to be “on-farm” as compared to “off-farm” compost. On-farm compost is produced on the organic farm that is applying for certification. All other sources are considered “off-farm.” The relevant additional annotations are provided. The term “feedstock” refers to the materials being composted. Feedstocks are like ingredients used in making compost.
Compost feedstocks	Acceptable feedstocks include: a) animal manures conforming to criteria specified in 5.5.1 of CAN/CGSB-32.310; b) animals, animal products and by-products (including fishery);	✓		Compost can be composed of: • animal manures, carcasses and offal from slaughtering; • plants and by-products, including certain forestry materials, as well as source-separated yard debris; and • soil and minerals provided they meet the requirements in this

Substance name(s)	Origin and usage	1	2	Guidance
	c) plants and plant by-products (including forestry and source-separated yard debris, such as grass clippings and leaves), pomaces and cannery wastes; d) soils and minerals that conform to the requirements of this standard and of CAN/CGSB-32.310; e) paper yard waste bags which contain coloured ink; and f) anaerobic digestate that conforms to the requirements of this standard. Substances listed in Table 4.2 (Column 1) are permitted in compost feedstocks when they meet the annotations therein. When evidence indicates that compost feedstocks could contain a substance or substances prohibited by Clauses 1.4 or 1.5 of CAN/CGSB-32.310 that is known to be potentially persistent in compost, before using the compost, compost test results shall be provided indicating no presence of the prohibited substance or a reference to scientific literature that establishes that the specific potential contaminant(s) will degrade during the composting process. The following composting feedstocks are prohibited: sewage sludge; compost starter and feedstocks fortified with substances not included in this standard; leather by-products; glossy paper; waxed cardboard; paper containing coloured ink other than paper yard waste bags; and animals, animal products and animal			standard and 32.310. Plant materials from non-organic agriculture or urban sources are permitted because composting can degrade GE organisms and most other contaminants. For example, residential food waste collected in biodegradable bags can be used as a compost feedstock as long as the bags and food waste decompose effectively during the composting process. The absence of petrochemical residues may need to be confirmed by testing. Likewise, non-organic spent brewers' grains from GE sources are an acceptable composting feedstock because GE residues break down during the thermophilic stage of the composting process. Knowing the source of feedstocks is extremely important. While most contaminants degrade in the composting process, some contaminants are persistent. For example, the picolinic acid family of herbicides (aminopyralid, clopyralid, picloram and triclopyr) do not degrade. These chemicals can accumulate in manure and compost and have devastating effects on crops for three years following the application. These herbicides are used on hydro right-of-ways and golf courses and are rarely used in conventional agriculture settings; clopyralid, such as in Lontrel, is sometimes used to control problematic weeds, such as thistles, often in spot treatments. The exception is where picloram is applied in conjunction with 2, 4-D as in Tordon (Dow). Also, Reclaim, which contains aminopyralid, is used to control weeds on rangeland and pastures. If the feedstocks might contain chemicals that can survive the composting process, such as the herbicide picloram or petrochemicals, the operator will need to show that these are not in the compost being applied in the farm. The operator can either test the compost for residues of the specific contaminants or provide scientific research that demonstrates that the

Substance name(s)	Origin and usage	1	2	Guidance
	by-products not guaranteed free of Specified Risk Material (SRM).			chemicals would have been degraded during the composting process used on that farm. Source-separated yard debris from municipalities may be in paper yard waste bags which contain coloured ink brand identification. This allowance for yard waste bags to be included in compost is a recent amendment, recognizing that urban homes can provide an important source of organic materials for organic farms. Leaves are an example of an excellent yard waste feedstock. Although yard waste bags are allowed, any other papers containing coloured inks cannot be added.
Compost from off-farm sources	Compost obtained from off-farm sources shall conform to the criteria specified in Table 4.2 Compost feedstocks. If compost is obtained from another farm, feedstock sources shall be documented. Compost obtained from all other sources shall comply to the following: a) shall not exceed the maximum acceptable levels of arsenic, cadmium, chromium, lead and mercury (mg/kg) and foreign matter outlined for unrestricted use compost (Category A), as specified in Guidelines for Compost Quality; b) shall meet criteria for acceptable levels (MPN/g total solids) of human pathogens as specified in Guidelines for Compost Quality; and c) shall not cause heavy metal buildup in soil.	✓		Most commercial compost producers will provide a laboratory analysis of their product or a guarantee that the product meets the compost quality guidelines as specified. If compost is obtained from a non-organic farm, testing will be needed to ensure that the heavy metal content is within the CCME limits. Compost must meet the required specifications, regardless of whether it is applied directly to the soil or blended with other ingredients. It is not necessary to test each feedstock before composting. Testing (including heavy metal analysis) is required at the end of the composting process before it is blended with any other substances, such as potting mixes, minerals, other compost, etc. Coliform and salmonella testing can be avoided if the compost is applied as raw manure, outside of the restriction of “90/120 days to harvest” rule outlined in 5.5.2 of CAN/CGSB-32.310. Compost which is composed entirely of plant materials is known to be free of human pathogens. Therefore coliform testing is not required. Compost obtained from off-farm sources must also satisfy the requirements for “Compost feedstocks.”

Substance name(s)	Origin and usage	1	2	Guidance
Compost produced on the farm	Compost produced on the farm shall conform to the criteria specified in Table 4.2 Compost feedstocks. In addition, if made from animal manures or other likely sources of human pathogens, compost produced on the farm shall: a) reach a temperature of 55 °C (130 °F) for a period of four consecutive days or more. The compost piles shall be mixed or managed to ensure that all of the feedstock heats up to the required temperature for the minimum time; or b) meet limits for acceptable levels (Most Probable Number of total solids per gram [MPN/g total solids]) of human pathogens specified in *Guidelines for Compost Quality*; or c) be considered as aged or raw manure rather than compost, that is, meeting requirements specified in subclause 5.5.2.5 of CAN/CGSB-32.310.	✓		This annotation outlines the requirements for making compost that is: • produced from feedstocks, such as manure, containing potential sources of human pathogens; and • can be applied at any time throughout the growing season. Many operators also employ a curing period of up to a year prior to application to allow the compost materials to fully stabilize and become a soil-like substance. Such well-cured compost is easy to apply and offers the greatest benefits to long-term soil health (although it has less of an immediate impact as a supply of readily available nutrients). Composting records are required including: • type of compost feedstocks; • documentation of the temperatures which the pile reaches at the various stages of composting; and • dates and rates of compost application. Or, one may decide not to monitor compost temperature, but rather rely on coliform and salmonella testing of the compost at the end of the process.
Compost tea	Compost tea shall be made from composts that conform to criteria specified in Table 4.2 Compost produced on the farm; Compost from off-farm sources; or Worm castings. Additional ingredients shall be listed in Table 4.2 (Column 1). If compost tea is applied directly to the edible parts of plants, the operator shall be able to demonstrate that	✓	✓	Compost tea is a source of available plant nutrients and a source of microorganisms which can outcompete disease organisms that are on leaves or soil. Substances are often added to improve the tea's effectiveness, including molasses to feed microorganisms, and a wetting agent such as yucca to help the compost tea adhere to leaves. Additives are permitted provided that they are listed on Table 4.2 (Column 1) and any restrictions are respected. For example, molasses is allowed

Substance name(s)	Origin and usage	1	2	Guidance
	best practices known to eliminate pathogens during the processing have been used OR that the requirements for raw manure, as specified in subclause 5.5.2.5 of CAN/CGSB-32.310, have been met. *See* the Compost tea definition in Clause 3 of CAN/CGSB-32.310.			as a soil amendment only if it is organic. This means that only organic molasses can be used as an ingredient in compost tea.
Condensed molasses fermentation solubles (Vinasse)	A by-product from the fermentation of cane, beet or agave sugar and/or their respective molasses. Shall be from non-GE feedstock. Shall not contain more than 7% total nitrogen (dry basis). Ammonium nitrogen shall not exceed 15% of the total nitrogen (dry basis). Nitrate nitrogen shall not exceed 10% of the total nitrogen (dry basis). Additional Nitrogen compounds may not be added post fermentation.	✓		*See* guidance for Brewers' grains and solubles.
Copper (plant nutrition)	Sulphates, carbonates, oxides and oxysulphates of copper may be used when soil and plant deficiencies are documented by visual symptoms or by testing of soil or plant tissue, or when the need for a preventative application can be documented. May be chelated with substances listed under Table 4.2 Chelates. Nitrates, chlorides, amino acid chelates, and ammonia-copper complexes are not permitted.	✓		A program of regular soil tests to monitor copper levels should be in place if copper products are used. High levels of copper in the soil can reduce plant growth and yields. Also, copper can accumulate in livestock forages and be toxic to animals, particularly sheep. High levels of copper are difficult to reverse. The oxysulphate form of copper is included as of 2026 to be consistent with other micronutrient listings.

Substance name(s)	Origin and usage	1	2	Guidance
	Shall be used with caution to prevent excessive copper accumulation in the soil. Copper build-up in soil shall prohibit future use. No residues of copper products shall be visible on harvested products.			
Copper (production aid)	Copper sulphate, copper hydroxide, copper octanoate, Bordeaux mix, copper oxychloride and copper oxide. Permitted for use as a wood preservative, or for controlling pests, including diseases. Shall be used with caution to prevent excessive copper accumulation in the soil. Copper build-up in soil shall prohibit future use. No residues of copper products shall be visible on harvested products.		✓	To avoid excessive copper accumulation in the soil, use copper products sparingly and test soils regularly to ensure that you are not exceeding safe limits. The annotation lists several allowed uses for copper: as a fungicide, as wood preservative, and as a crop production aid (to correct nutritional deficiencies in plants). As a fungicide, copper is a common treatment to control late blight in potatoes. Copper is also used as a spray post-harvest on apricot and peach trees to prevent blight.
Diatomaceous earth	Non-calcined forms. May contain substances listed in Table 4.2 (Column 2).		✓	Diatomaceous earth (DE) consists of the fossilized remains of diatoms, a type of hard-shelled algae. Contact with the fine powder leads to dehydration and death in soft-bodied insects. It is important to check with the supplier that the DE is not calcined. Check to ensure that no pesticides or synergists have been added.
Digestate, anaerobic	Permitted to be used for soil amendment, provided that the following conditions are met: a) the materials added to the digester shall be listed in Table 4.2 (Column 1) or permitted as Compost feedstocks; b) nutrients, vitamins and trace minerals other than nitrogen and phosphorus may be	✓		Anaerobic digestate is the byproduct of methane digestion. Anaerobic digestate was added in 2015 as methane digesters have become common on dairy farms. The digester produces methane from animal manure and other added feedstocks. A generator driven by methane produces electricity which provides power to the farm operation. Depending on the feedstocks and in order to facilitate optimal digestion, nutrients may be added during the process. These nutrients, vitamins and trace minerals may be used as described in the annotation.

Substance name(s)	Origin and usage	1	2	Guidance
	supplemented (in amounts needed for optimal metabolic performance of the digester) without restriction; c) shall not exceed maximum acceptable levels of arsenic, cadmium, chromium, lead and mercury (mg/kg), and foreign matter outlined for unrestricted use compost (Category A), as specified in Guidelines for Compost Quality; and d) shall meet the criteria for acceptable levels (MPN/g total solids) of human pathogens as specified in Guidelines for Compost Quality or the criteria for the application of raw manure on land specified in subclause 5.5.2 of CAN/CGSB-32.310 shall be met. When digestate feedstocks could contain a substance or substances prohibited by Clauses 1.4 or 1.5 of CAN/CGSB-32.310 that is potentially persistent, before using the anaerobic digestate, test results shall be provided indicating no presence of the prohibited substance or a reference to scientific literature that establishes that the specific potential contaminant(s) will degrade during the digestion process. It is permitted to use anaerobic digestate as a compost feedstock if it is added to other substances which are then composted. *See* Table 4.2 Compost feedstocks.			All feedstocks must be listed on Table 4.2 Column 1 and any restrictions in the listing must be met. Anaerobic digestate is an excellent source of very available nutrients and should be applied carefully in the same way as raw manure is applied: only when the soil is biologically active, and at a rate that is capable of being absorbed and utilized by the soil micro-organisms. This prevents nutrient run-off. Or anaerobic digestate can be harvested from the digester and placed into a holding tank where it can be composted with the addition of microorganisms and feedstocks. The composting process can then be monitored for temperature as outlined in the Composting on the farm annotation. If the temperature cannot be monitored, testing of the final product ensures that the composting process has been effective. Testing is not needed if the digestate will be applied 70/120 days before harvest as outlined in 5.5.2. Record what feedstocks are used in anaerobic digestion, and the dates and rates of application of the digestate.
Distillers' grains and solubles	A by-product or by-products from the production of alcohol by fermenting grain.	✓		Distillers' grains and solubles are by-products from alcohol distillation of a fermented cereal grain mash. These are not allowed as a soil amendment if ammonium bifluoride was added during the recovery period (to prevent

Substance name(s)	Origin and usage	1	2	Guidance
	Shall be from non-GE grain. Shall not contain more than 7% total nitrogen (dry basis). Ammonium nitrogen shall not exceed 15% of the total nitrogen (dry basis). Nitrate nitrogen shall not exceed 10% of the total nitrogen (dry basis). Nitrogen compounds, beyond what is needed for yeast nutrition, may not be added during the fermentation process and they may not be added post fermentation.			unintended bacterial growth). Corn stillage as a by-product of ethanol or corn oil production would require documentation confirming that the corn was non-GE. Also, *see* guidance for Brewers' grains and solubles.
Dormant oils	For use as a dormant spray on woody plants. Shall not be used as a dust suppressant.		✓	Dormant oils kill exposed insects and mites by either suffocating them (covering up their breathing tubes) or by directly penetrating the outside cuticle and destroying internal cells. Most dormant oils are light oils refined from crude oil. All oils manufactured for this purpose are allowed.
Dust suppressants	Vegetable oils, organic molasses or substances listed in Table 4.2 (Column 1 or 2) are permitted, for example: Lignin and lignin sulphonates (lignosulphonates), excluding Formulants used in crop production aids. Petroleum products are prohibited.	✓	✓	Dust suppressants are added to minerals to protect workers from lung disease associated with fine particulate material. The most common dust suppressant is mineral oil, however mineral oil and other petroleum products cannot be used. In organic applications. Only vegetable oil, organic molasses or other substances listed in Table 4.2 (Column 1 or 2) are allowed with one exception. Formulants used in crop production aids are not permitted.
Enzymes	Originating from plants, animals or microorganisms.	✓	✓	Enzymes are molecules that can increase the rate of chemical reactions within the root zone. Almost all enzymes are proteins and are produced using biofermentation. As microorganisms break down nutrients in the fermentation vat, they release enzymes. Farmers wishing to use enzymes as soil amendments will need to verify that the product is derived from plants, animals or microorganisms through the action of microorganisms and has not been fortified with

Substance name(s)	Origin and usage	1	2	Guidance
				synthetic substances. Enzymes that are products of GE organisms and/or GE substrates cannot be used; however, there is an exception. If a specific enzyme product made with non-GE substrate is not commercially available, operators can use products made with GE plant material-based substrates but only if the substrate does not remain in the final substance.
Extractants	The following may be used as extractants: a) water; b) culinary steam, as described in subclause 8.1.2 b) of CAN/CGSB-32.310; c) fats and oils, such as cocoa butter, vegetable oils, lanolin and animal d) fats, and alcohols other than isopropyl alcohol; e) supercritical CO2; and f) substances listed in Table 4.2 (Column 1 or 2) except for Formulants used in crop production aids.	✓	✓	Extractants are used to release active ingredients from plant materials. Examples of permitted extractants include enzymes, botanical pesticides, fats, amino acids, vitamins and other substances in Table 4.2 (Column 1 or 2).
Feather meal		✓		Feathers are ground up and extruded to make feathermeal which can be an excellent source of nitrogen. When applied to the soil, decomposition time is needed for the nitrogen to become available to plants.
Ferric phosphate (iron ortho-phosphate, iron phosphate)	Permitted as a molluscicide (for slug and snail control). Shall be used in such a manner that runoff into water bodies is prevented. Contact with crops is prohibited.		✓	Ferric phosphate is used as bait for slugs and snails.

Substance name(s)	Origin and usage	1	2	Guidance
Fibre row covers	Shall not be incorporated into the soil or left in the field to decompose; shall be removed at the end of the growing season.		✓	
Fish products	The following fish products are permitted: fish meal; fish powder; fish farm wastes and hydrolysate, emulsions and solubles. Fish farm wastes shall be composted. Only substances listed in Column 1 or 2 of Table 4.2 can be added to fish products with the exception that the addition of Formulants used in crop production aids is prohibited. Chemical treatment is prohibited, with the exception of the following substances which are in preferential order: a) vinegar; b) citric acid; c) phosphoric acid; or d) sulphuric acid. The amount of acid used shall not exceed the minimum needed to stabilize the product.	✓		Most fish products consist of guts, fins and scales of fish harvested from the wild. These can be applied directly to the soil or processed and applied as liquid, meal or powder. If the fish waste comes from farmed fish, it must be composted before being applied. The composting process leads to biodegradation of many chemicals including certain veterinary treatments and pool/equipment treatments. Manufactured fish by-products, such as processed fish meals or liquid fish fertilizers made with farmed fish and/or fish farm waste, do not have to be composted before use. Fish products often involve some processing, either dehydration to produce fish meal or liquefaction to produce hydrolysate. Note that preservatives are sometimes added to the processed fish product, only preservatives or other substances listed in Table 4.2 are allowed. Note however that Formulants used in crop production aids are prohibited. Farmers can use any substance in Table 4.2 other than Formulants used in crop production aids to adjust pH. While the standard expresses a preference for certain substances, it does not prohibit the use of any of these materials. The degree of pH adjustment is not limited by the standard but cannot exceed the amount required to stabilize the pH. This is to prevent fortification with prohibited substances
Formulants used in soil amendments	Shall be derived from biological or mineral sources unless a substance annotation permits the use of a specified formulant.	✓		The type of formulant allowed depends on the use. The list of formulants that can be used in soil amendments is much more restrictive than those which can be used in crop production aids (in which formulants would typically be used in much lower quantities).

Substance name(s)	Origin and usage	1	2	Guidance
	Substances listed elsewhere in Table 4.2 (Column 1) and used as formulants in soil amendments are subject to the annotations therein.			The annotation clarifies that a formulant is permitted for its functional effect on the substance and not permitted as an active ingredient, thereby discouraging the misuse of formulants as a nutrient source. The new definition for "Derived from biological or mineral sources" further clarifies that formulants cannot be new compounds synthesized from biological or mineral sources, but can only be isolated or extracted from these sources.
Formulants used in crop production aids	Formulants used in crop production aids may only be used with substances listed in Column 2 of this table. Only formulants classified as List 4A or 4B by the Pest Management Regulatory Agency (PMRA) or derived from biological or mineral sources may be used with substances in Table 4.2 (Column 2). Formulants classified as List 3 by PMRA may be used with passive pheromone dispensers. Formulants classified as List 4A, 4B or 3 by PMRA are not subject to 1.4 or 1.5 of CAN/CGSB-32.310. Formulants classified as List 1 or 2 by PMRA are prohibited.		✓	A formulant is any substance or group of substances other than the active ingredient that is intentionally added to a product to improve its physical characteristics (e.g., sprayability, solubility, spreadability or stability). Unlike active ingredients, formulants which are contained in the composition of an end-use product are not often mentioned on the product label. PMRA List 3 formulants are generally prohibited but would be allowed if the substance is listed on Table 4.2 Column 2 (e.g., an essential oil or soap) or Table 4.2 mined minerals. Otherwise their use is restricted to passive pheromone dispensers.
Frass	A by-product of insect farming. Shall be from an organic source if commercially available.	✓		Frass is the excrement of insects, often mixed with their bedding. Frass was added because it is becoming a readily available soil amendment which is similar, but not identical, to animal manure.
~~Guano~~		✓		Guano was removed from the PSL in 2026 – however some forms of rock phosphate may actually be mineralized guano. There are two types of guano in the global marketplace; fresh (a source of

Substance name(s)	Origin and usage	1	2	Guidance
				nitrogen and phosphorus) and fossilized or mineralized (a source of phosphorus). Some mineralized phosphorus products may actually be fossilized from guano; however, many are indistinguishable from phosphate rock. There are several potential negative consequences to using guano: (1) toxic metals may accumulate in the soil, (2) the guano may contain fungal or viral pathogens, which may pose a health risk to guano harvesters and farmers using guano, (3) harvesting may pose an ecological threat to bats or seabirds. Furthermore, CFIA does not permit guano to be imported into Canada as a fertilizer. Even if the guano is fossilized, these issues may be a concern if the mine is near an active bat or seabird colony. *See* Guano: organic fertilizer or trigger for war and pandemics? at https://mailchi.mp/organicfederation/guano.
Growth regulators for plants	Plant hormones, such as gibberellic acid, indoleacetic acid and cytokinins, made from terrestrial or aquatic plants or produced by microorganisms.		✓	Cytokinins are a class of plant growth substances that enhance the rate of cell division and plant growth. Gibberellic acid is sometimes used in laboratory and greenhouse settings to trigger germination in seeds that would otherwise remain dormant. It is also widely used in the grape growing industry as a hormone to induce the production of larger bundles and bigger grapes, especially Thompson seedless grapes. In the cherry industry, gibberellic acid is used as a growth regulator. Gibberellic acid produced by fermentation and extraction is considered to be non-synthetic and is permitted if produced using permitted extractants (Extractants). Requirements with regard to substrates/growth media must be met. Indoleacetic acid is another plant growth hormone produced in the bud region of the plant and can be used to enhance plant growth. As with all products of biofermentation, the substrate must be non-GE if

Substance name(s)	Origin and usage	1	2	Guidance
				such products are commercially available and the substance can only be used if the substrate does not remain in the final substance.
Homeopathic preparations			✓	Homeopathic preparations are made from plant, animal and mineral sources which are diluted and shaken vigorously (succussed) many times until all that remains is water and the life energy of the original ingredients.
Hormones	*See* Table 4.2 Growth regulators for plants.		✓	
Humates, humic acid and fulvic acid	Permitted if mined; produced through microbial activity; extracted by physical processes; or with: a) Table 4.2 Extractants; or b) potassium hydroxide—potassium hydroxide levels used in the extraction process shall not exceed the amount required for extraction. Levels (mg/kg) of arsenic, cadmium, chromium, lead and mercury shall not exceed the limits (category C1) specified in Guidelines for the Beneficial Use of Fertilising Residuals. Shall not cause a build-up of heavy metals or micronutrients in soil.	✓		Humates are subsurface mineral deposits which are found above certain coal seams known as leonardite. They are formed by the decomposition and compression of prehistoric plant and animal lifeforms. Humic and fulvic acids are extracted from leonardite and applied as a source of carbon to soils to help make organic nutrients more readily available to plants.
Hydrated lime (calcium hydroxide)	For plant disease control.		✓	Also known as slaked lime, calcium hydroxide is formed by adding water to calcium oxide (quicklime). The most common use of hydrated lime in disease control is as part of a Bordeaux mixture, where its role is to reduce the phytotoxicity of copper sulphate. Hydrated lime cannot be used as a soil amendment.
Hydrogen peroxide			✓	Hydrogen peroxide (H_2O_2) is sometimes used as a fungicide.

Substance name(s)	Origin and usage	1	2	Guidance
Hydrolyzed proteins of plant origin	Resulting from enzymatic hydrolysis (in conjunction with physical processes). Shall not contain more than 0.3% hydroxyproline (as a percentage of total amino acids). Shall not contain more than 15% N (dry basis). At least 90% of the total nitrogen shall be organic (protein) nitrogen. Isolated amino acids such as glycine, lysine and methionine are prohibited. Nitrogen compounds may not be added during hydrolysis.	✓		"Hydrolyzed proteins of plant origin" and "Hydrolyzed proteins of animal origin" replace "Amino acids." Both annotations contain content restrictions that reflect nutrient levels in unadulterated products. The criteria serve as a tool for assessing compliance and preventing undeclared substances/fraudulent products, thereby ensuring organic integrity. Differentiating between plant-origin and animal-origin hydrolyzed proteins adds clarity to further deter fraudulent claims of plant vs animal origin. Limitation on the hydroxyproline content (prevalent in mammalian collagen) allows for verification of origin of protein. Higher levels indicate animal origin. Limiting nitrogen content discourages fraudulent claims and allow for verification of acceptable processing (enzyme hydrolyzed) while higher concentrations would be the result of acid hydrolysis and possible addition of ammonium sulphate. The nitrogen concentrations are based on data from tested products. Lastly, restricting the application of animal-origin hydrolyzed proteins to the edible portion of crops helps safeguard against health issues and maintain the vegetarian status of the food.
Hydrolyzed proteins of animal origin	Resulting from enzymatic hydrolysis (in conjunction with physical processes). Shall not be applied to the edible portion of crops. Shall not contain more than 17% N (dry basis). At least 90% of the total nitrogen shall be organic (protein) nitrogen. Isolated amino acids such as glycine, lysine and methionine are prohibited. Nitrogen compounds may not be added during hydrolysis.	✓		
Inoculants	*See* Table 4.2 Microorganisms and microbial products	✓		Seed inoculants offer a number of benefits, as shown in the following examples: • Rhizobia are naturally occurring soil bacteria that can bind with legumes to establish a trade of atmospheric nitrogen for carbohydrates. • *Bacillus subtilis* is a seed inoculant which can offer protection against the fungi that can inhibit germination in cool soils.

Substance name(s)	Origin and usage	1	2	Guidance
				Mycorrhizal fungi can be used as a seed inoculant to help plants access phosphorus and other nutrients.
Invertebrates	Worms, insects (including sterile insects), nematodes, arthropods and other invertebrates. *See* Table 4.2 Worm castings; Shells from aquatic animals.	✓	✓	Examples of beneficial biological organisms and extracts include the following: • Releasing sterile insects can be effective in controlling populations of insect pests, such as the codling moth in orchards in the Okanagan-Kootenay region of British Columbia. • Granulosis virus is a well-known virus spray used to combat codling moth in apple orchards. • Bees in a greenhouse used to spread other beneficial organisms or pesticides as allowed by Table 4.2 Column 2. • Predatory insects, such as the two spotted stink bug or the spined soldier beetle, can effectively control many pest insects. • Parasitoid flies and wasps lay their eggs in the host's body. Once the eggs hatch, the larvae kill the host by eating it from the inside. Insects can be released to help create a balanced ecosystem in the field or greenhouse. Lacewings and ladybeetles are examples of generalists that consume a wide range of insect eggs and/or larvae.
Iron	Sulphates, carbonates, chlorides, oxides, oxysulphates, citrates, tartrates or permitted chelates of iron may be used when soil and plant deficiencies are documented by visual symptoms or by testing soil or plant tissue, or when the need for a preventative application can be documented. May be chelated with substances listed under Table 4.2 Chelates. Iron chloride may be used to prevent loss of phosphorus in soils prone to flooding without demonstrating a soil deficiency.	✓		Iron chloride is permitted for flood-prone land. With climate change and the increasing frequency of extreme weather events causing flooding, allowing its use will prevent the loss of phosphorus, an essential nutrient which is in finite supply.

Substance name(s)	Origin and usage	1	2	Guidance
	Nitrates, amino acid chelates, and ammonia-iron complexes are not permitted.			
Kaolin clay	May be calcined. Shall not be processed or fortified with substances unless listed in Table 4.2 (Column 2).		✓	Calcined kaolin clay is used to coat fine seeds; this separates the seeds and makes them easier to sow. It is also found in plastic mulches where calcined kaolin clay improves the thermal properties. Kaolin (often sold under the brand name Surround) is also used as a physical barrier against insect pests. Calcination is a process which heats the clay to a very high temperature to remove any moisture.
Kelp and kelp products	*See* Table 4.2 Aquatic plant extracts and Plant material.	✓	✓	
Leaf mould		✓		Leaf mould is produced by the breakdown of shrub and tree leaves and can be used as a soil amendment. Leaf mould can be added to compost, applied as mulch or dug into soil as a soil amendment.
Lignin and lignin sulphonates (ligno-sulphonates)	Permitted as a formulant ingredient(s), such as a chelating agent(s), binding agent(s), and as a dust suppressant(s). Ammonium lignosulphonate is prohibited. Other lignin forms, such as lignosulphonic acid, calcium lignosulphonate, magnesium lignosulphonate, sodium lignin and sodium lignosulphonate, are permitted.	✓	✓	Lignin sulphonates are a byproduct of forestry pulp and paper production.
Lime sulphur (calcium polysulphide)	Permitted on plants as: a) a fungicide; b) an insecticide; and c) an acaricide (mite control).		✓	

Substance name(s)	Origin and usage	1	2	Guidance
Limestone	Mined magnesium and calcium carbonates. *See* Table 4.2 Calcium.	✓		
Magnesium	The following sources are permitted: a) mined magnesium rock; b) b) magnesium chloride derived from natural brines; c) c) mined calcium magnesium carbonate (dolomitic limestone) that has not been slaked; d) d) potassium magnesium sulphate (langbeinite); e) e) magnesium sulphate (kieserite or Epsom salts) may be used when soil and plant deficiencies are documented by visual symptoms or by testing of soil or plant tissue, or when the need for a preventative application is documented.	✓		Magnesium rock can refer to any of more than 100 different magnesium compounds. For example, magnesite (magnesium carbonate occurs in rock formations, as does dolomitic lime (dolomite), which is derived from calcium-magnesium limestone. The natural source of magnesium chloride is extracted from brine solutions created by ancient sea beds and is permitted as a soil amendment. Anhydrous magnesium chloride is manufactured industrially and cannot be used. The farmer or operator will need to demonstrate that the soil or crop is deficient in magnesium (from soil or tissue tests or a soil consultant's recommendation) before applying magnesium sulphate. Because mined magnesium sulphate is no longer available, Epsom salts are allowed even if they are not mined.
Manganese	Sulphates, oxides, oxysulphates, carbonates, chlorides, citrates, tartrates or permitted chelates of manganese may be used when soil and plant deficiencies are documented by visual symptoms or by testing soil or plant tissue, or when the need for a preventative application can be documented. May be chelated with substances listed under Table 4.2 Chelates. Nitrates, amino acid chelates, and ammonia-manganese complexes are not permitted.	✓		

Substance name(s)	Origin and usage	1	2	Guidance
~~**Manure, composted**~~		✓		The annotations "Manure, non-organic source" and "Manure, composted" have been eliminated from Table 4.2 because they were redundant and already covered by (1) the Compost feedstock annotation in Table 4.2, which lists manure as an acceptable feedstock, and (2) the reference to non-organic manure as permitted by CAN /CGSB 32.310: 5.5.1.1. These annotations were also redundant with "Animal, manure."
~~**Manure, non-organic manure source**~~		✓		
Meat meal	Shall be processed by drying or heat sterilization or composted.	✓		Meat meal, bone meal, blood meal and feathermeal are all slaughterhouse byproducts. All commercial meat meal products are monitored to ensure that they are properly processed. If done properly, on-farm composting of carcasses is recognized as an acceptable practice and does not pose a risk to livestock of Bovine Spongiform Encephalopathy, also known as BSE or Mad Cow Disease.
Microbial extracts	Extracts of microorganisms (viruses, bacteria, protozoa, phages, and fungi), such as spinosad. Products may contain dead microorganisms and substances in Table 4.2 (Column 1 or 2). If the growth substrate includes substances not listed in Table 4.2 (Column 1), the growth substances (substrate) shall not be present in the final product, or be present at levels which have no material functional effect. Sewage sludge is prohibited. Carriers or substances added to or expected to be present in the final product shall be listed in Table 4.2. Pharmaceuticals made from biological sources, such as natamycin, penicillin and streptomycin, are prohibited even if registered as pesticides.		✓	This substance was added to permit substances extracted from dead microorganisms. These extracts had been included under the Microorganisms and microbial products, which has been modified to include only live, purposefully grown microbial products while excluding microbial extracts and microbial fertilizers.

Substance name(s)	Origin and usage	1	2	Guidance
	Does not include nutrient extracts such as nitrogen extracted from microorganisms. *See* Table 4.2 Microorganisms and microbial products and Microbial fertilizers.			
Microbial fertilizers	Microbial biomass that is the by-product of food processing. Examples include bacterial biomass and yeast press cake. If the growth substrate includes substances not listed in Table 4.2 (Column 1), the growth substances (substrate) shall not be present in the final product, or be present at levels that have no material functional effect. Sewage sludge is prohibited. Carriers or substances added to or expected to be present in the final product shall be listed in Table 4.2 (Column 1). Shall not exceed the limits (category C1) for acceptable levels (mg/kg) of arsenic, cadmium, chromium, lead and mercury, as specified in Guidelines for the Beneficial Use of Fertilizing Residuals. Shall not cause a build-up of heavy metals or micronutrients in the soil. Does not include substances extracted from microorganisms or produced by fermentation. *See* Table 4.2 Microbial extracts and Microorganisms and microbial products.	✓		This substance was added to separate microbial fertilizers from the microorganisms and microbial products in general since microbial fertilizers have a much different use and origin than their crop aid counterparts. The source of the fertilizers has been restricted to by-products of food production wastewater treatment; this excludes microbial fertilizers that were grown by using synthetic fertilizers and/or other growth substances to increase the nutrient content of the final product (i.e., the microbial fertilizer). The annotation limits the level of growth substances to what is needed to grow and support the microbial biomass. These growth substances and their presence in the microbial fertilizer are restricted to only ineffectual levels.

Substance name(s)	Origin and usage	1	2	Guidance
Microorganisms and microbial products	Living microorganisms, such as viruses, bacteria, protozoa, phages, and fungi. Microbial products may contain substances in Table 4.2 (Column 1 or 2). Examples include: rhizobium bacteria; mycorrhizal fungi; yeast; Bacillus thuringiensis; virus and virus sprays (e.g., granulosis). If the growth substrate includes substances not listed in Table 4.2, the growth substances (substrate) shall not be present in the final product, or be at levels which have no material functional effect. Sewage sludge is prohibited. Carriers or substances added to or expected to be present in the final product shall be listed in Table 4.2. Ionizing radiation is permitted for use on a peat moss carrier before the addition of microbial inoculants. Radiation is otherwise prohibited. Pharmaceuticals made from biological sources, such as natamycin, penicillin and streptomycin, are prohibited even if registered as pesticides. *See* Table 4.2 Microbial extracts and Microbial fertilizers.	✓	✓	This listing only includes products from live microorganisms while excluding products/extracts from dead microorganisms. These products are used for several purposes including: • inoculating legumes before seeding (e.g., rhizobial bacteria used on soybeans or alfalfa); • as soil amendments (e.g., mycorrhizal fungi); • inoculating compost (e.g., yeast and effective microorganisms). This allows for the use of any non-GE microorganism. However, operators must provide a statement from the supplier showing that the product is not genetically engineered. There is one exception: if a specific product made with non-GE substrate is not commercially available, operators can use products made with GE plant material-based substrates (such as GE corn or soybean substrates) but only under the conditions outlined in the annotation.
~~Micronutrients~~		✓		The Micronutrient listing was replaced by individual micronutrient listings to avoid confusion and to provide specific details about different micronutrients.
Milk and milk by-products		✓	✓	Milk or whey used as a soil amendment does not have to be organic, but it must comply with 1.4 of the CAN/CGSB 32.310. Milk from non-organic

Substance name(s)	Origin and usage	1	2	Guidance
				cows treated with the GE hormone Recombinant Bovine Growth Hormone (rBST), such as used in the USA would not be compliant.
Mined minerals, unprocessed	Mined minerals include basalt, pumice, sand, feldspar, mica, granite dust and unprocessed rock dust. Minerals extracted from seawater are permitted. To be allowed as a mined mineral, the product shall not have undergone any change in its molecular structure through heating, processing, ion exchange or combining with other substances. Sodium nitrate is prohibited. Rock dust mixed with petroleum products, such as those from stone engraving, is prohibited. *See* annotations for specific minerals in Table 4.2 (Column 1).	✓		Any mined mineral that has not been processed through heating or chemical reactions, and has not been combined with prohibited chemicals can be used. An example is Spanish River Carbonatite which is extracted, milled and bagged but does not undergo any change. Each load extracted from the mine site may have a slightly different composition but meets the minimum levels of calcium carbonite, biotite, apatite and rare earth minerals listed on the label. Minerals which have been extracted with flotation reagents are allowed given that the flotation reagents are removed from the final product. In 2026, the annotation was modified to clarify that sodium nitrate is prohibited (and not just sodium nitrate mixed with petroleum products). Sodium nitrate, also known as Chilean nitrate, is not permitted because it contains highly soluble nitrogen. Permitting this would be contrary to the organic principle that the soil, not fertilizers, should feed the crop.
Molasses	Shall be organic.	✓		Molasses can provide a carbon source to enhance plant availability of nutrients and stimulate plant growth. It is sometimes an ingredient in compost tea and is also added to soils. Even if the soil amendment is a multi-ingredient product, the molasses component must be organic.
Molybdenum	Sodium molybdate and molybdenum trioxide may be used when soil and plant deficiencies are documented by visual symptoms or by testing soil or plant tissue, or when the need for a preventative application can be documented.	✓		

Substance name(s)	Origin and usage	1	2	Guidance
	May be chelated with substances listed under Table 4.2 Chelates. Ammonium molybdate and amino acid chelates complexes are not permitted.			
Mulches	Biological materials from organic sources are permitted (e.g., straw, leaves, grass clippings, hay, wool or untreated burlap). If organic materials are not commercially available, non-organic, non-genetically engineered sources may be used provided that prohibited substances have not been used on these materials for at least 60 days before harvest. Prohibited mulch material includes, but is not limited to, sawdust, wood chips, bark and shavings that is treated or processed with Formulants used in crop production aids or with substances, such as herbicides, preservatives and glues, not listed in Table 4.2 (Column 1 or 2). Newspaper and paper mulch are permitted; glossy paper and coloured ink are prohibited. Plastic mulches: Non-biodegradable and semi-biodegradable materials shall not be incorporated into the soil or left in the field to decompose. Use of polyvinyl chloride as plastic mulch or row cover is prohibited.	✓	✓	In addition to plant materials, wool from organic or non-organic operations could be used as mulch. Plastic mulches: Plastic mulches can be used if they are picked up at the end of the season. A woven polypropylene weed barrier cloth can be left in place, for example in an orchard or vineyard, for years as long as it doesn't start to degrade. Materials made from polyvinyl chloride are not permitted. Fully biodegradable mulches: Many farmers have grown accustomed to using mulch products marketed as biodegradable. The packaging of these products leads some customers to assume that they contain only substances which are consistent with organic principles. In fact, there are currently no fully biodegradable films on the market which meet the Canadian Organic Standard. Fully biodegradable mulches may not contain any synthetic substances including petrochemicals. The formulants and ingredients must all be listed on Table 4.2. Restrictions apply even if substances are used as components of a biodegradable mulching material. For example, if micronutrients are embedded in the mulch, the annotation for micronutrients must be addressed. *See* also "Biodegradable plant containers" in Table 4.2 Column 2.

Substance name(s)	Origin and usage	1	2	Guidance
	Biodegradable mulches: 100% of biodegradable mulch films shall be derived from bio-based sources. Formulants or ingredients shall be listed in Table 4.2 (Column 1 or 2). Biodegradable polymers and Carbon Black from GE or petroleum sources are not permitted.			
Mushroom compost	*See* Table 4.2 Compost.	✓		Often referred to as 'spent mushroom substrate,' mushroom compost is the growing medium left over after mushrooms have been harvested. Mushroom compost is made from agricultural materials, such as hay, straw, straw horse bedding, poultry litter and gypsum. Sphagnum peat moss is often added to the substrate. It is important to know the source of the mushroom compost as it may contain pesticide residues, particularly organochlorides used against the fungus gnat. Chemicals may also have been used to treat the straw and to sterilize the compost. Bags of mushroom compost sold at local garden centers do not come with guarantees that the product can be used in organic farming unless the bag carries a certifier's logo. Check with your certifier before using any product that is not from a certified organic mushroom farm.
Ozonated water	Water saturated with ozone gas. For control of microbial pathogens in crops as a foliar application. Neither the ozonated water nor the gas is permitted for weed control or soil fumigation.		✓	Ozonated water has been shown to be effective for the control of powdery mildew and has a low environmental risk. It degrades to oxygen with no residues or negative impact to the environment.
Nitrogen gas	For controlled atmosphere storage.		✓	Controlled atmosphere storage is a non-chemical process in which oxygen levels in sealed rooms are reduced, usually by the infusion of nitrogen gas. Temperatures are kept at a constant 0C to 2C (32F to 36F).

Substance name(s)	Origin and usage	1	2	Guidance
				Humidity is maintained at 95 percent and carbon dioxide levels are also controlled according to the product being stored. *See* "Oxygen."
Non-ionizing radiation	May be used to manage pest load.		✓	The definition of irradiation in CAN/CGSB-32.310 (Clause 3) clearly distinguishes between ionizing and non-ionizing radiation by specifying the wavelength threshold where ionizing radiation begins. Ionizing radiation, which alters DNA or chemical structure, remains prohibited. At the same time, this standard explicitly recognizes that non-ionizing technologies, such as ultraviolet (UV) treatments, can be used for pest and pathogen management on crops and food-contact surfaces.
Oilseed meals	Shall be organic if commercially available.	✓		Operators can avoid genetically engineered oilseed meals by using organic oilseeds. Finding non-GE oilseed meals may be challenging because most non-organic oilseed meals (including soybean, canola and cottonseed meal) are made from genetically engineered crops. If you use a non-organic oilseed meal, be sure to obtain a statement from the supplier confirming that organic oilseed meals are not available and that the non-organic oilseed meal is non-GE. This applies even when the non-organic meal is a component of a multi-ingredient fertilizer: an operator would need to perform a commercial availability search for a fertilizer blend that is fully compliant (i.e., non-GE) before using this product. Anti-caking agents to keep non-organic oilseed meals free-flowing are not permitted unless they are listed on Table 4.2.
Oxygen	For controlled atmosphere storage.		✓	
Peat moss		✓		Much of the commercial peat moss contains wetting agents. Only the wetting agents listed in Table 4.2 *Surfactants* are permitted.

Substance name(s)	Origin and usage	1	2	Guidance
Peracetic (peroxyacetic) acid	Formulations of peracetic acid may include unreacted residual reagents and catalysts, such as hydrogen peroxide, acetic acid and sulphuric acid. Permitted for: a) pest control; and b) b) disinfecting and cleaning seeds and plant stock. *See* Table 7.3.		✓	Peracetic acid is produced by treating acetic acid with hydrogen peroxide. It is an ideal anti-microbial agent due to its high oxidizing potential. Peracetic acid kills microorganisms by oxidation and subsequent disruption of their cell membrane. Any source is allowed.
Pheromones and other semiochemicals	All sources are permitted. For pest control.		✓	Pheromones trigger a behavioural response in another member of the same species, usually attracting the insects and keeping them from mating. A semiochemical is a generic term used for a chemical substance or mixture that affects insect behaviour; this includes pheromones, allomones, kairomones, attractants and repellents. Pheromones and semiochemicals are the only active ingredients allowed in pheromone traps; other pesticides are not permitted unless they are listed in Table 4.2 Column 2. Also, spray applications of semiochemicals are not permitted.
Phosphate rock	May be fortified or processed with substances listed in Table 4.2 (Column 1) with the exception that treatment with acid prior to application is not permitted. Cadmium shall not exceed 90mg/kg P2O5.	✓		"Organic farming has a phosphorus problem," according to Dr. Joanne Thiessen Martens from the University of Manitoba. "This problem is especially common in long-term organic systems if livestock manure is scarce and the soil is alkaline."[1] The problem with phosphorus (P) has three facets - improving access to the P already in the soil, finding sources of P, and avoiding an excess of P, which can lead to water pollution. One challenge is ensuring crops can take up the phosphorus already in the soil. Not all forms of P can be used by plants, particularly in alkaline soils. Soil microorganisms, particularly plant growth-promoting rhizobacteria (PGPR) help increase the solubility of P, which makes it

[12] https://mailchi.mp/organicfederation/phosphorousstruvite

Substance name(s)	Origin and usage	1	2	Guidance
				more available for plants. Organic farmers can make the best of a bad situation by supporting vibrant and diverse soil microbial populations. Also, incorporating cover crops in the crop rotation can help make more P available to crops. However, more P may still be needed as a soil amendment. Another challenge is finding suitable sources of phosphorus (P). When crops are harvested and sold, the phosphorus contained in the plant material leaves the farm and must be replaced. Research on organic farms has found that "in most cases more P is removed with the products than applied as fertilizer leading to reductions in plant-available soil P which threatens the long-term sustainability of organic farming systems."[2] Depending on the type and location of the farm, it may be difficult to obtain effective sources of phosphorus. Sources include livestock manure, rock phosphate, guano, bonemeal, fish fertilizers (stabilized with phosphoric acid), urine and struvite. **Rock phosphate** is a common source of phosphorus for organic farmers but with several shortcomings. For one, it is a non-renewable resource. Rock phosphate is mined from the earth (sometimes from ancient sites of bat or bird colonies). Depleting a non-renewable resource violates the organic principle of care, which states "Organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment." Rock phosphate contains a relatively low concentration of P. Shipping a heavy load of rock powder with a low P level is expensive, particularly for remote farms, such as those on the prairies. Also, not all the P in rock phosphate is available to plants. In alkaline soils, such as many prairie soils, applications of rock phosphate might do little if anything to provide P to plants.

Substance name(s)	Origin and usage	1	2	Guidance
				Also, rock phosphate can contain toxic metals. Cadmium often occurs naturally in association with mined phosphate rock. The amount of P_2O_5 used in the calculation is the total amount, not the available amount. The use of soluble nutrients is contrary to soil building as the foundation of nutrient management. The listing has been modified to eliminate treatment with acid which causes a chemical reaction that renders the macronutrient soluble.
Plant extracts, oils and preparations	Permitted extractants include fats and oils (such as cocoa butter, lanolin and animal fats); alcohols; water; or substances listed on Table 4.2 (Column 2) other than Formulants used in crop production aids. Extraction with other solvents is prohibited except with, in order of preference: a) potassium hydroxide; or b) sodium hydroxide; provided the amount of solvent used does not exceed the amount necessary for extraction. The operator shall provide an affidavit from the manufacturer that proves the need to use sodium hydroxide. For control of pests (e.g., diseases, weeds and insects). Plant oil, such as clove or mint oil is permitted for sprout inhibition in potatoes. *See* Table 8.3 Botanical oils.		✓	Plant extracts and preparations can be used to control pests. These substances may simply deter pest pressure by either masking the odour of a plant or repelling a pest, or they may actually kill pests. Plant oils can be used as spreader-stickers, surfactants and carriers.
Plant material	Aquatic or terrestrial plant biomass including cover crops, green manures, crop wastes, hay, straw,	✓		Organically produced green material can be applied directly to soils as mulch, as trench compost, or chopped and tilled into the soil. If the green

Substance name(s)	Origin and usage	1	2	Guidance
	leaves, peat, forestry by-products, hulls and grain screenings. Does not include plant-based food products or by-products of food processing, fermentation or chemical treatment, such as corn steep liquor or concentrated nutrient extracts. However, certain products may be permitted under separate listings in Table 4.2; see Oilseed meal, Plant extracts, oils and preparations, Molasses, Pomaces, Cannery waste, Lignin and lignin sulphonates, etc. Wastes from crops that have been treated or produced with prohibited substances are permitted as compost feedstocks only (subject to Compost feedstock restrictions). Prohibited plant materials include sawdust, wood chips, bark and shavings that are treated or processed with Formulants used in crop production aids or with substances, such as herbicides, preservatives or glues, that are not listed in Table 4.2 (Column 1 or 2).			material is from a non-organic source, it can only be used if it is added to compost. Composting breaks down most toxic substances.
Plant protectants	Mineral and biological substances including, but not limited to: calcium carbonate (from chalk, limestone, etc.); diatomaceous earth; kaolin clay; pine oil; pine resin; and yucca. White wash (solution of hydrated limestone) is permitted for use on trees to protect against sunburn and southwest disease.		✓	*See* annotation for Tree seals.

Substance name(s)	Origin and usage	1	2	Guidance
	Permitted to protect plants from harsh environmental conditions (such as frost and sunburn), infection, the build-up of dirt on leaf surfaces, or injury by an invertebrate pest or disease.			
Plastic for row covers and solarization	Non-biodegradable and semi-biodegradable materials shall not be incorporated into the soil or left in the field to decompose. Use of polyvinyl chloride as plastic mulch or row cover is prohibited.		✓	PVC tubing is a stable form of polyvinyl chloride. Operators can use PVC tubing to suspend row cover over the row. However, sheet PVC cannot be used as row covers or as sheets to solarize the soil. *See* Mulches.
Polyoxin D zinc salt			✓	Polyoxin D zinc salt is a crop protectant (anti-fungal agent) which has a low environmental impact.
Pomaces	Feedstocks shall be from organically grown fruits or vegetables. Non-organic pomaces shall be composted. *See* Table 4.2 Compost feedstocks.	✓		Pomace is the pulp, peel, seeds and stalks of fruit or vegetables after the oil, water, or other liquid has been pressed out. “Feedstocks” refers to the source of the material, such as the fruit or vegetable.
Potassium	The following potassium sources are permitted: a) mined potassium magnesium sulphate (langbeinite) and mined potassium magnesium chlorides (sylvinite and kainite); b) potassium rock powder—includes basalt, biotite, mica, feldspar, granite, glauconite and greensand; c) potassium chloride—muriate of potash or rock potash. The use of potassium chloride shall not cause salt build-up in soil through repeated application;	✓		When looking for a mineral source of potassium, mined sources are available, as well as refined minerals such as potassium chloride and potassium sulphate. Potassium chloride (also known as muriate of potash) is a naturally occurring potassium salt. Salt build-up can be monitored using soil tests. Potassium sulphate also provides sulphur. Allowed sources of potassium sulphate include both potassium sulphate produced by evaporating brines from seabed deposits, as well as potassium sulphate created through passive ion exchange when two mined minerals are mixed.

Substance name(s)	Origin and usage	1	2	Guidance
	d) potassium sulphate—shall be produced by evaporating brines from seabed deposits or combining mined minerals using ion exchange. Potassium sulphate made using sulphuric acid as a reactant is prohibited.			
Potassium bicarbonate	For pest and disease control for crops grown in greenhouses and other structures, and for other crops.		✓	Potassium bicarbonate can combat fungal organisms which are a major issue in green-houses, orchard crops and grapes. Good pest control practices, such as ensuring adequate air flow and reducing humidity, are essential first steps before resorting to pest control products. *See* CAN/CGSB-32.310-5.6
Pyrethrum	May be combined with Formulants used in crop production aids. *See* Table 4.2 Botanical pesticides for restrictions.		✓	Pyrethrum is derived from the dried flower heads of the Dalmatian Chrysanthemum (*Chrysanthemum cinerarifolium*) and Persian Chrysanthemum (*C. coccineum*). Pyrethroids, such as permethrin, are synthetic insecticides and are not permitted. Pyrethrins are often combined with a synthetic chemical, piperonyl butoxide, which is not permitted. The method of production determines whether a substance is permitted or not. For example, pyrethrin is used as a pest repellent. In its natural form, pyrethrin is an extract made from the flowers and seeds of *C.hrysanthemum cinerarifolium*. However, when pyrethrin is paired with the synthetic synergist piperonyl butoxide, the combined formula is not permitted. Synergists enhance the action of the pesticide and increase its persistence in the environment. Tinkering with the pyrethrin formula in the lab has resulted in pyrethroids, synthetic chemicals de- rived from pyrethrin. The chemical change from pyrethrin to pyrethroids results in a product which is more toxic to non-target species and more persistent in the environment. Neither pyrethrins paired with piperonyl butoxide nor pyrethroids can be used; however, the non-synthetic pyrethrin is permitted.

Substance name(s)	Origin and usage	1	2	Guidance
Quicklime (calcium oxide)	Shall not be used as a fertilizer or as a soil amendment.		✓	Quick lime is produced by heating calcium carbonate to at least 825oC. It can be used to make whitewash used as paint on farm buildings and painted on fruit tree trunks to prevent winter sunscald.
Repellents	Shall be derived from biological sources, such as sterilized blood meal, rotten eggs, hair or predator scents. May contain substances listed in Table 4.2 Column 2.		✓	
Salt	Sodium chloride, calcium chloride or potassium chloride; shall be mined or derived from sources of natural brine. The effluent from ion exchange water softener regeneration may be used for pest control.		✓	Salt has various purposes. For example, in mushroom production, salt can be sprinkled on the top of the substrate to prevent disease from infecting the growing mushrooms.
Seaweed and seaweed products	*See* Table 4.2 Aquatic plant extracts and Plant material.	✓	✓	
Seed lubricant	Talc and graphite are permitted and other substances listed in Table 4.2 (Columns 1 and 2).		✓	Graphite and/or talc-based seed lubricants are dry lubricants that are needed in the operation of seeders.
Seed treatments	Includes microbial products, kelp, yucca, gypsum, clays and botanicals. May contain substances listed in Table 4.2 (Column 1 or 2) or Table 7.3. *See* Table 4.2 Peracetic Acid; Treated Seeds and refer to clause 5.3.5 of CAN/CGSB-32.310. Sodium hypochlorite 2.5% solution may be used to disinfect Solanaceae seeds.		✓	Seed treatments include: • kelp to help suppress disease, such as damping off; • biological organisms (e.g., *Rhizobium*) to provide nutrients to the growing plant. Seed coat ingredients are often trade secrets and manufacturers may only be willing to disclose their recipes under confidentiality agreements with certifiers. Be sure to check with your certifier before using treated seeds. Seed pelleting covers the seed with clay or other substances to increase

Substance name(s)	Origin and usage	1	2	Guidance
				the size of small seeds to facilitate seeding. Pesticide seed treatments are not allowed unless they are listed in Table 4.2. Sodium hypochlorite is permitted as a disinfectant for seed that is threatened by the Tomato Rough Brown Fruit Virus, which can affect all members of the Solanaceae family.
Selenium	Sodium selenate and sodium selenite may be used when: (1) soil and plant deficiencies are documented by visual symptoms, (2) testing of soil or plant tissue indicates deficiencies, or (3) when the need for a preventative application to maintain plant, animal or human health can be documented.	✓		
Shell from aquatic animals	Includes chitin.	✓	✓	Chitin is the exoskeleton of insects and crustaceans. It is a major component of crabmeal and other crushed shellfish shells, which are commonly used as a soil amendment in coastal communities where shellfish is harvested. Chitosan, however, is extracted from chitin using various chemicals and is not permitted. Chitin has been used to control root knot nematodes when applied to the soil around potato and bean seed.
Silicic acids, including potassium and sodium salts of silicic acid	Includes potassium and sodium silicates (and associated hydrates), and silicic acids such as monosilicic acid. May be pH-adjusted with sodium or potassium hydroxide, or with acids listed in Table 4.2. Formulations shall not contain more than 0.1% P2O5 (dry basis) and not more than 0.1% N (dry basis).		✓	This new listing for synthetic silicates (permitted only as crop production aids (column 2)) has been created to separate synthetic sodium and potassium silicates from the permitted mined sources (column 1) of the Silicon, silica and silicates. These natural forms of silicon remain permitted as they are included in the “Mined minerals, unprocessed” listing.

Substance name(s)	Origin and usage	1	2	Guidance
	For unprocessed silicon minerals, such as Wollastonite, *see* Table 4.2 Mined minerals, unprocessed.			Silicic acid formulations are permitted. Silicic acid is understood to have a crop protection effect in response to stresses such as drought and fungal disease. Allowing its use will provide another pest management tool for operators. Also, sodium silicate can be used to reduce post-harvest decay due to fungal organisms. The annotation also restricts levels of potassium and nitrogen to discourage overuse of pH adjusters. These limits serve as a tool to assess compliance and thereby ensure organic integrity.
Soaps	Soaps (including insecticidal soaps) shall consist of fatty acids derived from animal or vegetable oils.		✓	Soaps may contain formulants such as isopropyl alcohol, provided the formulants are listed on PMRA 4A or 4B. Dehydrated alfalfa or other fertilizers may be added to boost nutrients. Limestone is often added to moderate acidity.
Soaps, ammonium	As a large animal repellent. Direct contact with soil or edible portion of crop is prohibited.		✓	
Sodium bicarbonate	For pest and disease control for crops grown in greenhouses and other structures, and for other crops.		✓	
Soil	From organic sources. Shall comply with restrictions specified in subclause 5.1.2 of CAN/CGSB-32.310. *See* definition of Soil in Clause 3 of CAN/CGSB-32.310. For soils used in containers, *see* Transplant media, potting soil and potting media.		✓	Soil can be used if the operator can verify that no prohibited substances have been applied in the past 36 months.

Substance name(s)	Origin and usage	1	2	Guidance
Sphagnum moss	May contain wetting agents that are listed in Table 4.2 Surfactants.	✓		Sphagnum moss is a highly valued ingredient in peat moss as it is able to hold up to 20 times its own weight in water. Wetting agents are used to lower the surface tension of sphagnum moss, allowing water to penetrate the substance, instead of running off. Natural wetting agents, such as yucca, can be used and other surfactants permitted in Table 4.2 *Surfactants*.
~~**Stillage and stillage extract**~~		✓		Stillage and stillage extract has been replaced by more precise substances such as Distillers' grains and solubles and Brewers' grains and solubles and Condensed molasses fermentation solubles.
Struvite (magnesium ammonium phosphate)	Obtained through precipitation from one or more of the following: a) liquid animal manure as described in CAN/CGSB-32.311 Table 4.2 (Column 1) Animal Manure, unprocessed, and in subclause 5.5.1 of CAN/CGSB-32.310; b) anaerobic digestate as described in Table 4.2 (Column 1); c) liquid waste from the processing of foods, beverages, pet foods or animal feeds; d) wastes from the processing of ethanol or biodiesel from plant-based agricultural feedstocks; and/or e) municipal wastewater that has undergone advanced treatment processes/systems capable of reducing impurities to levels below those attainable through conventional secondary or biological treatment.	✓		Struvite (magnesium ammonium phosphate) is more soluble than rock phosphate but much less soluble than chemical phosphate fertilizers or liquid manure. Phosphorus from struvite is released slowly by reaction with acids exuded from plant roots. This means that P will be available to crops when they need it and less likely to be lost from the field (and result in water pollution) when the soil is bare [compared to more soluble forms of phosphorus]. Allowing the use of struvite recovered from wastewater is part of the circular (closed-loop) nutrient economy. This is a form of nutrient recycling, which is part of the principles of organic agriculture. Rather than flushing nutrients down the toilet and letting them potentially contaminate water sources, they will be used as a resource on organic farms. Dr. Joanne Thiessen Martens, who has been studying the use of struvite in cropping systems, writes that 'results so far suggest that struvite can be a very good fit as a soil amendment in organic cropping systems. It is an affordable phosphorus input that is effective in alkaline soils for at least

Substance name(s)	Origin and usage	1	2	Guidance
	The type of wastewater stream and exact location(s) of the wastewater facilities shall be documented. May contain incidental precipitated phosphate salts. Struvite products from non-organic source animal manure (a) and municipal wastewater (e) shall contain: a) a phosphorus content (expressed as P2O5) between 25% and 30% (dry matter basis); b) a maximum organic carbon content of 1.5% (dry matter basis); c) a nitrogen content between 4% and 6% (dry matter basis); and d) a magnesium content (expressed as Mg) between 8% and 11% (dry matter basis) Derivatives from struvite are prohibited. Shall not exceed the maximum acceptable levels of arsenic, cadmium, chromium, lead and mercury (mg/kg) and foreign matter outlined for unrestricted use compost (Category A), as specified in Guidelines for Compost Quality. Shall not cause a build-up of heavy metals or micronutrients in soil. Shall meet criteria for acceptable levels (MPN/g total solids) of human pathogens as specified in Guidelines for Compost Quality.			some crops, with low risk of environmental losses. It also aligns well with organic principles." (Thiessen Martens, 2022) Municipal sludge often contains various contaminants ranging from pharmaceuticals to toxic metals to PFAS (per- and polyfluoroalkyl substances, persistent chemicals such as those used in waterproofing clothing). Due to this issue, only struvite made from treated wastewater, not from sewage sludge, is permitted. This is water that is considered pure enough to be released into the environment. The change in 2026 permits the use of struvite that has been recovered from more sources including municipal wastewater. As of March 2025, there are no sources of struvite in Canada that have been precipitated from liquid animal manure (the only type of struvite permitted in 2020). The only source of struvite is from the municipal waste stream source. The hope is that struvite from multiple sources will eventually become available. Permitting struvite from municipal wastewater provides a source of phosphorus - which is greatly needed for alkaline P-deficient soils (alkalinity inhibits plant uptake of phosphate from many natural sources). The definition of sewage sludge (in Clause 3 of Can/CGSB-32.310) has been modified to permit struvite extracted from wastewater. It is reasonable to distinguish sewage sludge (biosolids), which are prohibited, from the wastewater that has undergone advanced treatment (this is what the commercially available struvite is extracted from). Struvite recovered from municipal wastewater is now approved for organic use in the EU. This decision was made after extensive study by the Expert Group for Technical Advice on Organic Production and the EU general fertilizer commission, which found this form of struvite to be safe for humans, animals and the environment (subject to purity restrictions). The listing in the Canadian PSL exceeds the purity standards laid down in

Substance name(s)	Origin and usage	1	2	Guidance
	Struvite from municipal wastewater (e): a) shall not exceed total aluminium 0.1% (dry matter basis). b) shall not exceed total iron 1% (dry matter basis); and c) shall have no more than 6 mg/kg of any substance classified as a PAH (polycyclic aromatic hydrocarbon) as defined in the Toxic Substances List (schedule 1) of the Canadian Environmental Protection Act (1999). For the evaluation of aluminium, iron and PAHs, struvite shall be measured using vacuum drying at 40°C until a constant weight to avoid the loss of crystal-bound water.			EU rules. *Sources*: https://mailchi.mp/organicfederation/phosphorestruvite-11037816 for an article on struvite and here https://mailchi.mp/organicfederation/phosphorestruvite-11037816 for an article on Phosphorus on organic farms: from struvite to peecycling.
Sugars	Organic sugars (e.g., sucrose, glucose, fructose) are permitted.	✓	✓	Sugar is sometimes added to compost tea or used in seed treatments to both stimulate microbial activity and help a substance stick to where it's needed (e.g., helping compost tea stick to foliage, or a seed inoculant stick to a seed).
Sulphur smoke bombs	Use of sulphur smoke bombs shall be permitted in conjunction with other methods used for rodent control when a full pest control program is maintained but temporarily overwhelmed.		✓	
Sulphur, elemental	Both mined and reclaimed sources of elemental sulphur are permitted.	✓	✓	Sulphur is usually applied as an ion in combination with a cation (potassium sulphate, calcium sulphate, magnesium sulphate) which is a plant-available form. It takes time for the soil to break down elemental sulphur and make it available to plants. For this reason, elemental sulphur should be applied well in advance of the time when the plant needs

Substance name(s)	Origin and usage	1	2	Guidance
				sulphur. Elemental sulphur can acidify the soil.
Summer oils	On foliage, as suffocating or stylet oils.		✓	Summer oils are used to create a barrier that protects the foliage of fruit trees against insects. They are only used before the fruiting period.
Surfactants	Includes plant-derived saponins, such as *Yucca schidigera* and *Quillaja saponaria*, or substances listed in Table 4.2 Formulants used in soil amendments; Formulants used in crop production aids; Soaps.	✓	✓	Surfactants break the surface tension on water to disperse ingredients and they help dry materials to absorb water. Surfactants break the surface tension on water to disperse ingredients; they also help dry out materials so they can absorb water.
Transplant media, potting soil and potting media	Shall be composed entirely of permitted substances listed in Table 4.2 (Column 1 or 2). Soil from the field may be used provided that prohibited substances have not been used on the soil for at least 36 months.	✓		Potting soil can be purchased or made on the farm. Most potting soils are a mix of peat moss, sand, compost, bark, perlite and/or vermiculite. Dehydrated alfalfa or other fertilizers may be added to boost nutrients. Limestone is often added to moderate acidity. Natural wetting agents, such as yucca extract, may be used.
Treated seed	*See* Table 4.2 Peracetic acid; Seed treatments and refer to subclause 5.3.5 of CAN/CGSB-32.310.		✓	*See Seed treatments.*
Tree seals	Plant or milk-based paints are permitted. May only be combined with substances listed in Table 4.2 (Column 1 or 2). *See* Table 4.2 Plant Protectants. For planting stock: commercial grafting materials are permitted, provided that plants are maintained in accordance with requirements of CAN/CGSB-32.310 for at least 12 months prior to harvest of organic products.		✓	Tree seals can be used to protect trees from pests and winter sunscald; they can also be used as a sealant on injuries to prevent disease entering the tree. Because organic tree whips are not available in most areas, conventional planting stock treated with synthetic grafting materials and other substances not listed on the PSL can be purchased as outlined in CAN/CGSB-32.310 (5.3). The non-bearing trees must be reared organically for a minimum of 12 months before organic products can be harvested from them.

Substance name(s)	Origin and usage	1	2	Guidance
Vermicasts	*See* Table 4.2 Worm castings.	✓		Earthworm droppings are called vermicasts or worm castings.
Vermiculite		✓		Vermiculite is a natural mineral that expands with the application of heat. Vermiculite is commonly used as an addition to potting soil to hold moisture for slow release.
Vinegar (acetic acid)	*See* Table 4.2 Acetic acid.		✓	
Vitamins	Biological and mineral sources of all vitamins are permitted. Non-biological and non-mineral sources of vitamins B1, C (ascorbic acid) and E are permitted.	✓	✓	Vitamins can stimulate plant growth but their effectiveness has not been documented. Most permitted vitamins are derived from plants or minerals, although there are exceptions for vitamins B1, C (ascorbic acid) and E.
Water		✓	✓	All water sources including seawater are allowed. Farmers are wise to be cautious to protect their soils from salination if salty sea water is added regularly. Soil salination can be difficult to reverse. Soil salinization is defined as an increase in salt in the soil to a level at which salt becomes toxic to plants. It can occur over time from continuous use of irrigation in dry areas or from the application of soil amendments that are high in salts.
Water, recycled	Recycled water shall only contain substances listed in Tables 4.2 (Column 1 or 2), 7.3 and 7.4. Recycled wash water from all organic operations, including dairy operations, may be spread on crop lands. Requirements for land application, as specified in subclause 5.5.2.5 of CAN/CGSB-32.310, shall be met. In all other uses, recycled water shall meet applicable irrigation water regulatory requirements. Wastewater from sewage or industrial treatment plants is not permitted.	✓	✓	Recycled water is water that has been used on the farm to wash vegetables, irrigate crops or rinse dairy equipment. Vegetable wash water normally contains only particles of dirt but may contain chlorine residues from municipal water sources. Irrigation or flooding water that has been captured before it runs off the field normally contains only soil particles and nutrient residues. Dairy equipment wash water contains milk residues and approved cleaners. Any off-farm sources of recycled water require a statement from the supplier identifying the ingredients. For example, run-off from conventional fields containing pesticide residues would not be accepted.

Substance name(s)	Origin and usage	1	2	Guidance
Wetting agents	*See* Table 4.2 Surfactants.	✓	✓	A wetting agent is often added to help a substance, such as a potting soil, absorb water. Saponins are soapy compounds produced by plants which can help to break the surface tension. They are sometimes used to help substances, such as compost tea, adhere to leaves. Given compost tea's ability to help prevent disease, the improved adherence will protect the plant over a longer period of time and fewer applications will be required.
Wood ash	*See* Table 4.2 Ash.	✓	✓	
Worm castings	Worm castings (also called vermicompost, worm compost, vermicasts, worm humus or worm manure) are the end product of the breakdown of organic matter and compounds by some earthworm species. Feedstocks for earthworms shall meet the criteria in Table 4.2 Compost feedstocks. The operator shall be able to demonstrate that: a) worm castings produced either on the farm or obtained from off-farm sources meet the limits for acceptable levels (MPN/g total solids) of human pathogens as specified in Guidelines for Compost Quality; or b) best practices known to eliminate human pathogens during vermicomposting have been used. *See* Table 4.2 Microorganisms and microbial products for information on compost starters.	✓		
Yeast	See Table 4.2 Microorganisms and microbial products.	✓		

Substance name(s)	Origin and usage	1	2	Guidance
Zinc	Sulphates, oxides, oxysulphates, carbonates, chlorides, citrates, lignosulphonates or permitted chelates of zinc may be used only when soil and plant deficiencies are documented by visual symptoms or by testing soil or plant tissue, or when the need for a preventative application can be documented. May be chelated with substances listed under Table 4.2 Chelates. Nitrates, amino acid chelates, ammonia-manganese complexes and polyphosphates are not permitted.	✓		Zinc oxide occurs in nature as the mineral zincite but can also be chemically synthesized. Zinc sulphate is produced through a chemical process in which sulphuric acid and zinc oxide are combined. Sulphuric acid sources of zinc sulphate are permitted as there are no other available sources.

5. Permitted Substances Lists for Livestock Production

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5. Permitted Substances Lists for Livestock Production

		Guidance
5.1	**Classification**	
5.1.1	Livestock production substances are classified according to the following uses and applications:	Prohibited materials and substances are listed in subclauses 1.4 and 1.5 of the Standard. For example, products that result from genetic engineering, and nano- technology are prohibited in general, along with veterinary drugs. In terms of the use of amino acids, phytase and vaccines for livestock and the use of vitamins for animal and human consumption, where there is no alternative and the substance is required, organic farmers can use forms of these substances that were made from or contain residues from genetically engineered (GE) products. These exceptions reflect difficult decisions. The organic community doesn't want to allow the use of any genetically engineered products, but members of the CGSB Technical Committee on Organic Agriculture considered these exceptions were warranted to help organic farmers maintain the health of their livestock.
5.1.1 a	Feed, feed additives and feed supplements;	
5.1.1 b	Health care products and production aids — Health care products include medications, remedies, parasiticides and other substances used to maintain or restore the well-being of an animal. Production aids include all other substances used on animals and their living areas, such as bedding, teat seals and teat dips.	
5.1.2	Substances listed in Tables 5.2 and 5.3 shall comply with prohibitions in Clauses 1.4 and 1.5 of CAN/CGSB-32.310. The following additional requirements apply to substances produced on substrates or growth media (for example, microorganisms and lactic acid):	
5.1.2 a	if the substance includes the substrate or growth media, the substrate or growth media ingredients shall be listed in Table 5.2 or 5.3;	
5.1.2 b	if the substance does not include the substrates or growth media, the substance shall be produced on non-genetically engineered substrates or growth media, if commercially available.	
NOTE	In Canada, livestock feed shall meet the compositional and labelling standards of the *Feeds Regulations*, 2024. Ingredients used in livestock feed must be approved and listed in the Canadian Feed Ingredients Table of the Feeds Regulations, 2024. Some ingredients and products require registration (such as enzymes and chelate minerals).	

Table 5.2 - Feed, Feed Additives and Feed Supplement

Substance name(s)	Origin and usage	Guidance
Amino acids	As an exception to subclause 5.1.2 (CAN/CGSB-32.311) and Clause 1.4 a) of CAN/CGSB-32.310, isolated amino acids may be used when organic protein feeds and non-organic feed additives that are listed in Table 5.2 cannot meet amino acid requirements to produce a balanced feed as per subclauses 6.4.1 and 6.4.2 of CAN/CGSB-32.310.	Ideally, animals will get adequate levels of amino acids from feed and forage. Pasture-raised birds and pigs can get a certain level of amino acids from consuming insects and grubs in the soil. The challenge is getting adequate levels for poultry and hogs when they are not foraging outside. Farmers can supplement their feed with organic insect meal, fish meal and various byproducts of human food production, such as brewer's yeast, corn gluten and spent grains from distillers. However, two essential amino acids (lysine and methionine) are particularly challenging to provide. Methionine is essential for weight gain, egg production and feather formation in poultry. A grain-based diet low in methionine can result in increased feather pecking and poor growth. When birds are foraging on pasture, methionine is obtained from plant material and insects. During the winter, it has proven difficult to find organic feeds high in methionine, so the standard allows supplements. Similarly, lysine, an essential amino acid, is required for good growth rates in pigs and poultry. Supplemental lysine is allowed for both pigs and poultry if adequate levels cannot be obtained from other feed sources. If protein levels in the diet are increased to provide adequate levels of lysine and methionine, there can be excessive N excretion which, in turn, is problematic because it can lead to ammonia in the barn and water pollution from the litter. All forms of methionine, including GE forms, are allowed if alternatives are not commercially available.

Substance name(s)	Origin and usage	Guidance
		Consequently, isolated amino acids are permitted in organic livestock feeds in the quantities required for a balanced diet. Isolated amino acids are necessary components of livestock diets to keep the animals in good health. Having low amounts of amino acids would create a problem with animal welfare. All isolated amino acids are used by exception since they are usually produced by GE bacteria via fermentation. Methionine production usually does not involve GE bacteria, but is produced by chemical synthesis.
Antioxidants	Derived from materials produced by living organisms (such as, but not limited to, plants, animals and microorganisms) using substances listed in Table 6.3 Extraction solvents and precipitation aids. Example: tocopherols derived from plants.	Antioxidants help maintain the quality of the feed by preventing oxidation, which causes feed to become rancid and less palatable. The most common antioxidant used in non-organic livestock feed is ethoxyquin which is not allowed in organic production because it is synthetic (i.e., not "derived from materials produced by living organisms (such as, but not limited to, plants, animals and microorganisms) using substances listed in Table 6.3 Extraction solvents, and precipitation aids." Natural sources of antioxidants include tocopherols (vitamin E), rosemary extract, lecithin, beet juice, oregano and thyme.
Colouring agents	From biological sources.	Only colouring agents from biological sources can be used. Examples include alfalfa meal and dehydrated beets. Note that all the ingredients of the colouring agents must also be listed in Table 5.2. For example, a common feed colouring agent is tagetes meal, which is made from the Aztec marigold (*Tagetes erecta*). Although the petals of the marigold are allowed, tagetes meal is not permitted if it is made with ethoxyquin, a prohibited substance.
Diatomaceous earth	As a preventative livestock health care practice for control of internal parasites, and as an anti-caking agent. Shall be food grade (non-calcined).	Diatomaceous earth (DE) consists of fossilized remains of diatoms, a type of hard-shelled algae. Food-grade (non-calcined) forms should be used. These are not as finely ground as the forms of DE powder

Substance name(s)	Origin and usage	Guidance
	As free choice, or up to 2% of total diet, or as an anti-caking agent in feed ration.	sold for pool filters. Because of that, the food-grade forms are less likely to cause lung damage to livestock or farmers.
Energy feeds and forage concentrates (grains) and roughages (hay, silage, fodder, straw)	Shall be obtained from organic sources. May include silage preservation products. See Table 5.2 Hay or silage preservation products.	
Enzymes	Derived from plants, animals or microorganisms. Examples include, but are not limited to, bromelain, bovine liver catalase, ficin, animal lipase, malt, pancreatin, pepsin, trypsin, proteases and carbohydrases. Animal-derived enzymes shall be free of Specified Risk Material (SRM). This annotation will be reviewed at the next revision of the standard. See Table 5.2 Phytase.	Enzymes aid digestion and the absorption of poorly available nutrients. Carbohydrase, for example, increases the amount of energy available in feed by breaking complex carbohydrates down into simpler sugars. Protein in soybeans, for example, is more available thanks to protease. Enzyme supplements are rarely necessary if high-quality feed is provided, but they can help improve feed efficiency when livestock are fed lower-grade feedstuffs. Most of the permitted enzyme supplements are made from plants, animals or microorganisms. For example, bromelain can be made from pineapple, catalase from beef liver, and ficin from the sap of fig trees. However, the situation becomes more complicated with phytase. *See* Table 5.2 *Phytase*.
Fishmeal	Shall be organic if commercially available. All preservatives and other ingredients shall be listed in Table 5.2.	Although organic fish meal is not currently readily available, this source is preferred in the expectation that it may be more available in the near future.
Flavours	Shall be organic.	

Substance name(s)	Origin and usage	Guidance
Food waste	Organic food for human consumption or by-products from organic food production (excluding abattoir waste).	Livestock may be fed organic food waste (≥ 95% organic content) if it is part of a healthy, balanced diet. Food products containing 70-95% organic ingredients can only be fed according to the derogation in 6.4.8.
Hay or silage preservation products	Preference should be given to bacterial or enzymatic additives derived from bacteria, fungi and plants and food by-products (such as molasses and whey). The following acids may be used: lactic, propionic and formic.	Only the substances listed in the annotation or permitted in livestock feed can be used with dry hay. For example, although salt is not specifically mentioned in this annotation, it would be allowed for hay treatment, as salt is permitted in livestock feed. Anhydrous ammonia is not allowed as a silage preservation agent because it is a synthetically derived substance that is prohibited by 1.5 of 310. Likewise, propionic products containing prohibited compounds such as ammonium hydroxide are not permitted. Always check with the supplier to ensure forage inoculants are not products of genetic engineering.
Mammalian or avian slaughter by-products	From organic sources and guaranteed free of Specified Risk Materials (SRM). Shall be used only to feed insects.	The CFIA has not yet established a clear enforcement on safety issues related to insects as feed or food, however this will be implemented soon. If the insect feed might contain SRM, the onus is on the producer to show the final insect product is safe for feed for food. A careful consideration of the entire process of rearing insects should identify any potential contaminants that may be inherent in the insects, the growth substrate or introduced via production and processing steps.
Manure or other animal waste	Sourced from organic livestock operations. Shall be used only as a component of feed formulas for insects.	
Microorganisms and yeasts	If organic sources of yeast are not commercially available, non-organic yeast sources, including yeast autolysate, shall be used.	The annotation applies to yeasts and yeast cell wall products used as feed supplements, not yeast-derived protein. That is considered a protein feed and consequently only an organic source can be used. Yeast autolysate is also known as yeast extract. This is a concentrate of the soluble components of yeast cells, produced by autolysis, a

Substance name(s)	Origin and usage	Guidance
		process by which the cell wall is induced (mechanically or chemically) to rupture.
Milk replacer	Shall be organic if commercially available. Permitted for emergency use. Without antibiotics and animal fats or by-products.	Milk replacer is a commercial product with multiple ingredients that has to be reconstituted with water before being fed. When searching for allowed sources of non-organic milk replacer, look for products that include all-milk protein (because the alternative is likely soy-based and assumed to be derived from genetically engineered soy). Ensure the product does not contain Animal Plasma Protein (a blood by-product). Milk replacers often contain animal fats, such as tallow or lard which are not permitted, but coconut oil is allowed. Ensure that the product is non-medicated. If the label does not have all the information, it must be obtained from the manufacturer. Milk replacer (whether organic or otherwise) cannot be used as a general part of the feeding regimen. The intent of the standard is that young mammals are fed whole organic milk (*see* CAN/CGSB-32.310, 6.4.4); milk replacer is to be used only in an emergency, such as the death of the dam. The subclause 6.4.4 also contains details about the use of milk replacer when a dam's milk may transmit a disease to young or when the dam has been treated with antibiotics. It is advisable to have provisions in place for providing natural milk and colostrum to orphan animals (such as, using nurse mothers, adoption, and saving and freezing milk). At the same time, it is understood that birthing emergencies are not uncommon and that the welfare of young animals is the most important issue.
Minerals, trace minerals, elements	Unprocessed rock dusts; ground animal or plant material (other than blood or bone meal); and seawater are preferred sources.	The most common trace minerals are iron, copper, zinc, manganese, cobalt, iodine and selenium. Permitted non-synthetic minerals come from naturally occurring sources (such as mined salt). A documented

Substance name(s)	Origin and usage	Guidance
	Chelated and sulphated forms are permitted. If none of the aforementioned sources are commercially available, other versions are permitted except for forms containing or produced with EDTA or EDDHA.	search for such sources is required before using synthetic sources. Even if chemically manufactured minerals are the only sources available, they cannot be used if they contain or were produced with EDTA or EDDHA.
Molasses	Shall be organic.	
Phytase	Permitted when feed supplementation with phytase is recommended to reduce the phosphorus level in manure and thereby reduce the potential environmental consequence. As an exception, GE-derived sources of phytase are allowed even though they are not compliant to subclause 5.1.2 of CAN/CGSB-32.311 or Clause 1.4 a) of CAN/CGSB-32.310. This substance and annotation will be reviewed at the next revision of the standard.	Much of the phosphorus (P) in plant tissue is stored as phytate-phosphorus, a form which is difficult for monogastrics, such as pigs and poultry, to digest. Phosphorus can be provided by plant foods containing P, such as corn and soybean meal. However, much of the inaccessible phosphorus in these foods is then excreted and causes eutrophication of nearby water bodies. To avoid this, farmers can supplement the feed with the enzyme phytase that helps break down phytate-P so that the animals can use more of the P in their diet. Genetically engineered sources of phytase will be permitted due to the lack of alternatives and the need for phytase supplements to maintain livestock health while minimizing the environmental impact. *See* also Table 5.2 *Enzymes*.
Pre-mixes	Concentrated mixture of minerals and vitamins. From organic sources if commercially available. All ingredients in pre-mixes shall be essential for animal nutrition, and listed in Table 5.2. Non-GE fillers, for example rice hulls, may be non-organic.	Pre-mixes often include calcium, phosphorus, salt and trace minerals (including selenium) along with vitamins. They can also include probiotics. Medicated pre-mixes are not allowed. *See* also listings for the

Substance name(s)	Origin and usage	Guidance
		individual ingredients.
Probiotics	Probiotics may be administered orally, as dietary supplements, via pharmaceutical preparations in the form of capsules, tablets, alginate gels, or dry powder.	Probiotics are micro-organisms (bacteria and yeasts) that provide health benefits when consumed. They help build immune systems to fight infection and increase the gut's ability to absorb nutrients. *Lactobacillus* and *Bifidobacterium* are the most common examples. An agricultural product used as growing media to produce probiotics does not have to be organic. However, a probiotic cannot be used if the growing media/substrate is genetically engineered and remains in the final product. If the substrate was from a GE product (e.g., corn or soybean) but does not remain in the final product, it is allowed if there is no other alternative. *See* 5.1.2 b of the PSL.
Protein feeds	Shall be from organic sources.	Protein feeds include oilseed meals, alfalfa pellets and corn products. Note that mammalian and avian by-products (whether organic or otherwise) are prohibited. *See* also Fishmeal in this table.
Seaweed meal	Shall be organic if commercially available (to be reviewed in 2030).	There are some certified organic sources, but there are many other seaweed producers/harvesters who are not certifying their product as organic (for livestock feed) simply because it is not required by Table 5.2. Seaweed is more often certified organic when it is going to be used as a crop input. It is logical to move towards requesting certified organic seaweed for livestock feed because the capacity for such a product exists and there is no substantial hurdle to certify these products.

Substance name(s)	Origin and usage	Guidance
Vitamins	Permitted for enrichment or fortification. Vitamin formulants that comply with Canadian regulations are accepted, including those containing non-organic agricultural carriers. Vitamins not compliant to subclause 5.1.2 of CAN/CGSB-32.311 are permitted.	Vitamins cannot be used for the purpose of improving meat colour or any purpose other than enrichment and fortification of the feed. Given the dominance of GE vitamins in the livestock feed supplement market, all forms of vitamins will be permitted, even genetically engineered forms. Carriers are needed because vitamins are added in very tiny quantities that must be distributed evenly in the feed, and some carriers are not organically acceptable as they are nanoparticles. The intent of the vitamin listing is to permit any source of vitamin because of their necessity in animal diets, the small amounts added, and the methods of producing the vitamins.

Table 5.3 - Health Care Products and Production Aids

Substance name(s)	Origin and usage	Guidance
Acetylsalicylic acid	Aspirin.	Aspirin, or acetylsalicylic acid (A.S.A.), is a salicylate drug, often used as an analgesic to relieve minor aches and pains. Any source is allowed for livestock health care.
Acids	Ascorbic, acetic, propionic, citric, formic and lactic acids and vinegar. Permitted for all uses such as treatment of water and bedding.	Water pH has an impact on animal health; acids can be added to reduce pH, which in turn reduces bacterial load.
Activated charcoal	Shall be of plant origin.	Used to treat poisoning and sometimes bloat.
Alcohol, ethyl (ethanol)	Permitted as a disinfectant and sanitizer.	Also known as “grain” or “drinking” alcohol.
Alcohol, isopropyl	Permitted as a disinfectant.	Also called “rubbing alcohol.” It is used as a topical antiseptic for treatment of wounds and helps prevent infection.
Antibiotics	*See* Clause 6.6 of CAN/CGSB-32.310, for conditions pertaining to antibiotic use in livestock. *See* Table 5.3 Antibiotics, oxytetracycline.	*See* guidance for 6.6 of CAN/CGSB 32.310, Organic Production Systems – General Principles and Management Standards.
Antibiotics, oxytetracycline	For emergency use for bees. The equipment shall be destroyed in accordance with subclause 7.1.15.7 of CAN/CGSB-32.310; treated bees do not need to be destroyed if they are taken out of organic production.	Oxytetracycline is allowed when the health of a honeybee colony is threatened by a serious disease outbreak, for example a serious case of American Foulbrood. Details of how it can be used are provided in 7.1.15.7 of CAN/CGSB 32.310.

Substance name(s)	Origin and usage	Guidance
Anti-inflammatories	Non-steroid anti-inflammatories such as ketoprofen. Preference shall be given to alternative products, such as those listed in Table 5.3, Botanical compounds; and Homeopathy and biotherapies. To reduce inflammation. *See* subclause 6.6.4 c) 2) of CAN/CGSB-32.310.	In 6.6, the standard states that anti-inflammatories shall be "non-steroid" or, as they are commonly referred to, "NSAIDS." Anti-inflammatory refers to the property of a substance or treatment that reduces inflammation. Anti-inflammatory drugs make up about half of analgesics (pain relievers). They alleviate pain by reducing inflammation, as opposed to opioids which affect the brain. Many steroids, specifically glucocorticoids, reduce inflammation or swelling by binding to cortisol receptors. These drugs are often referred to as corticosteroids. Common examples of NSAIDS include aspirin, ketoprofen, flunixin and meloxicam. Withdrawal time for meat and milk differs depending on the drug – double the time required on the label or 14 days, whichever is longer. In addition to medical drugs, many herbs are reported to have anti-inflammatory qualities.
Biologics		*See* the definition of "Veterinary biologic" in Clause 3 of CAN/CGSB 32.310. A veterinary biologic is a substance or mixture of substances derived from animals, helminthes (parasitic worms or nematodes), protozoa (one-celled organisms) or micro-organisms (e.g., bacteria). They can also be of synthetic origin. Biologics are used for diagnosis, treatment and prevention of a disease or disorder. They involve an immunological response to a particular disease agent. The Canadian Health of Animals Regulations stipulates that "a veterinary biologic does not include an antibiotic except when it is used as a preservative or when it is an integral part of the veterinary biologic." It is understood that some vaccines contain trace amounts of antibiotics as preservatives. The intent of this standard is to allow the

Substance name(s)	Origin and usage	Guidance
		use of these vaccines, until such time as vaccines without antibiotics become available. *See* Vaccines in this table.
Botanical compounds	Botanical preparations, such as atropine, butorphanol and other medicines from herbaceous plants shall be used according to label specifications. Substances containing petroleum-derived formulants, such as propylene glycol, shall not be fed to livestock.	Botanical compounds are derived from plants and can be used for a variety of purposes. Essential oils fall under this category. Citrus extract is a common botanical used in cleaners. All sources, whether organic or not, are allowed for livestock health care, provided they comply with Subclause 1.4.a (i.e., they are not derived from products of genetic engineering) however “substances containing petroleum-derived formulants, such as propylene glycol, shall not be fed to livestock.”
Calcium borogluconate	For milk fever. No withdrawal period required.	Used to restore blood calcium levels when cows, sheep or goats suffer from milk fever after giving birth. Milk fever occurs when calcium levels are depleted by the labour process and sudden production of large quantities of milk. Methods to prevent milk fever include breeding for less milk, improving access to pasture, reducing stress and altering feeding strategies.
Chlorhexidine	For surgical procedures conducted by a veterinarian. To be used as a post-milking teat dip when alternative germicidal agents and physical barriers have lost their effectiveness. *See* Table 5.3 Teat dips and udder wash.	This is a chemical antiseptic which is active against bacteria and yeasts.
Colostral whey	Probiotic.	This product is derived from cow colostrum. It does not need to be from organic sources unlike colostrum (*see* below).
Colostrum	Shall be organic if commercially available.	Colostrum is the first milk released from the udder after the animal gives birth. It is richer in protein than milk and contains antibodies which protect the newborn from disease. It can be collected and stored frozen for emergency use for up to a year without loss of

Substance name(s)	Origin and usage	Guidance
		quality. Try to always have some on hand for emergencies. Colostrum produced on the farm is superior to that from elsewhere because it provides immunity to the existing pathogens in the local environment. The organic colostrum products on the market are intended as a natural health supplement for humans.
Copper sulphate	As an essential nutrient (source of copper and sulphur) and for topical use (foot baths).	Also called bluestone. Copper sulphate produced using sulphuric acid is allowed.
Diatomaceous earth	For use in control of external parasites and as a preventative practice for control of internal parasites. For internal use, diatomaceous earth shall be food grade (non-calcined).	*See* Table 5.2 for use in feed. Diatomaceous earth (DE) consists of fossilized remains of diatoms, a type of hard-shelled algae. Non-calcined (food-grade) forms should be used. These are not as finely ground as the forms of DE powder which are sold for pool filters, and therefore the food-grade products are less likely to cause lung damage to livestock or farmers. External parasite control is achieved by dusting the animals and the litter or bedding area. It is best to guard against inhaling the DE dust when applying it.
Electrolytes	Including, but not limited to: CMPK (Calcium, Magnesium, Phosphorus, Potassium), calcium propionate and calcium sulphate. Shall not contain antibiotics. Orally or by injection.	Electrolyte solutions can be used to treat illness, such as scours (diarrhea). Electrolyte supplements can be added to livestock drinking water to prevent illness (usually in times of stress, such as shipping). Most electrolyte solutions contain sodium, chloride and potassium, as well as glycine, dextrose, glucose and alkalinizing agents (bicarbonate, citrate, lactate, acetate or propionate). Many electrolyte solutions also include direct-fed microbials. These are bacteria that are meant to reestablish the correct ratios of gut microflora.

Substance name(s)	Origin and usage	Guidance
		Usually these probiotics consist of *Lactobacillus* and *Bifidobacterium* species, both of which work against *E. coli* and are beneficial to the intestinal environment. Such microbials are allowed, provided they are not products of genetic engineering.
Formic acid	For apicultural use, to control parasitic mites. The use of this substance shall be discontinued 14 days before harvesting the hive products.	Many beekeepers treat hives with formic acid several times during the beekeeping season in order to control varroa mites, and thereby keep the colony alive. Health Canada states that "Maximum residue limits (MRLs) are not required for formic acid." Non-synthetic formic acid can be found in nature; it causes the sting from ants and stinging nettles, and can even be found at low concentrations in wild honey.
Formulants (inerts, excipients)	Shall be used in conjunction with substances listed in Table 5.3. Formulants are not subject to Clause 1.4 or 1.5 of CAN/CGSB-32.310 or subclause 5.1.2 of this standard.	In livestock health care products and aids, formulants that would otherwise be prohibited due to the restrictions in 1.4 and 1.5 of 310 are permitted.
Glucose		Glucose is a monosaccharide (or simple sugar), also known as grape sugar. Glucose is produced commercially via the enzymatic hydrolysis of starch. Corn, rice, wheat, potato, cassava, arrowroot and sago are all used (as the source of starch) in various parts of the world. Glucose is used to treat ketosis (pregnancy toxaemia), among other livestock symptoms and diseases. For health care purposes, glucose is not required to be organic.
Glycerol (glycerine, glycerin)	Shall be from organic sources if commercially available. Shall be from vegetable oil or animal fat. Shall be produced using fermentation or by hydrolysis.	Glycerine (glycerol) is a sugar alcohol typically obtained from plant and animal sources. It is also a by-product in the production of biodiesel. Organic versions are more likely to be produced from organic corn or soy.
Homeopathy and biotherapies		Homeopathic therapy involves treatments that can produce, in a healthy animal, symptoms similar to those of the illness. According to

Substance name(s)	Origin and usage	Guidance
		homeopaths, serial dilution, with shaking between each dilution, removes the toxic effects of the remedy while the qualities of the substance are retained by the diluent (water, sugar or alcohol). Biotherapy is any form of treatment that uses the body's natural abilities to fight infection and disease. It is used as a generic term for a number of alternative medicine practices (e.g., herbal medicines, bioenergy treatment, acupuncture, acupressure and so on) which are generally regarded as safe. Whether they are effective is a matter for the operator to determine.
Honey	Shall be organic.	
Hydrated lime (calcium hydroxide)	Shall not be used to deodorize animal wastes.	This is also called slaked lime (calcium hydroxide) and is not the same as quicklime. It can be used as an astringent compound, topically in solutions or lotions. It can also be used as whitewash to help disinfect livestock facilities.
Hydrogen peroxide	Pharmaceutical grade hydrogen peroxide is permitted for external use (disinfectant). Food-grade hydrogen peroxide is permitted for internal use (for example, added to livestock drinking water).	There are many grades of hydrogen peroxide. Pharmaceutical (or cosmetic) grade hydrogen peroxide at 3.5% is the variety found in drug stores; it is used as antimicrobial agent for treating wounds and as a sanitizing agent. Food-grade hydrogen peroxide is either 35% or 50%. Note that the food-grade label does not mean this product can be ingested. Food-grade hydrogen peroxide is used as an antiseptic in food handling and preparation, and to disinfect water lines. It is sometimes added to livestock water to improve water quality, reduce bacteria counts or improve performance. For livestock water, 30 ppm of food- grade hydrogen peroxide is recommended. For example, to achieve 30 ppm H2O2: add 10 oz. (295 ml) of 35% to 1000 gallons (3785 litres) of water or add 30 ml to 475 litres. Follow product instructions when handling food-grade hydrogen

Substance name(s)	Origin and usage	Guidance
		peroxide—this is a highly reactive product.
Iodine	If used as a topical disinfectant: permitted iodine sources include potassium iodide and elemental iodine. If used as a cleaning agent: non-elemental iodine shall be used; iodine shall not exceed 5% solution by volume (example: iodophors). Use shall be followed by a hot-water rinse.	Iodine is a potent antiseptic. Tincture of iodine is 10% elemental iodine in an ethanol base; it also contains iodides. Iodophor iodine is alcohol-free. Iodophors were developed to overcome the side effects associated with elemental iodine. For cleaning, the more complex iodine compounds or iodophors are used because they are less likely to contaminate ground or surface water or soil.
Iron products	May be supplied by ferric phosphate, ferric pyrophosphate, ferrous lactate, ferrous sulphate, iron carbonate, iron gluconate, iron oxide, iron phosphate, iron sulphate or reduced iron.	This list includes all the possible sources for iron.
Lanolin	For external use only, such as udder balm (ointment).	
Local anesthetics	Such as lidocaine. Use of pharmaceutical local anesthetics shall be followed by withdrawal periods of 90 days before slaughter for meat products, and seven days for milk. Preference shall be given to alternatives, such as clove oil, listed in Table 5.3 Botanical compounds; Homeopathy and biotherapies.	Cold (ice) is a proven natural anesthetic. Acupuncture is reported to be a natural anesthetic, as well as many plants (e.g., cloves, oregano, aloe vera, echinacea, garlic oil, tarragon, lavender) and bee propolis. It is preferable to use such materials and techniques rather than pharmaceutical anesthetics, such as lidocaine.
Magnesium sulphate	Mined sources. A source of magnesium and sulphur.	This is Epsom salts. This substance can be used as a laxative and for treating hypomagnesaemia (grass staggers). It can be used as a mild astringent to remove splinters, treat infections and assist healing of bruises and muscle strain. Note that synthetic sources of mined magnesium sulphate are allowed.
Mineral oil	For external use.	Mineral oil or liquid paraffin is a by-product in the distillation of

Substance name(s)	Origin and usage	Guidance
		petroleum to produce gasoline. It can be used to suffocate parasites topically, such as mites on the legs and feet of poultry.
Minerals, trace minerals, elements	Non-synthetic chelated or sulphated minerals. Examples include oyster shell, calcium chloride and magnesium oxide. Synthetic nutrient minerals may be used if non-synthetic sources are not commercially available. Minerals from any source are permitted for medical use.	The most common trace minerals are iron, copper, zinc, manganese, cobalt, iodine and selenium. Non-synthetic minerals would be from naturally occurring sources (such as mined salt or bentonite clay), while synthetic minerals are chemically manufactured. Various forms of minerals are allowed, including zinc oxide used as an antiseptic ointment, and zinc sulphate used in footbaths or for oral therapy if the diet is deficient in zinc. Colloidal sulphur (for health care) produced using electrolysis is allowed, as is colloidal silver produced by a biofermentation process, as long as the genetically engineered restrictions specified in 1.4.a) (CAN/CGSB-32.310) are met.
Microorganisms and yeasts	If organic sources of yeast are not commercially available, non-organic yeast sources derived from living yeast, including yeast autolysate, shall be used.	The annotation applies to yeasts and yeast cell wall products. Yeast autolysate is also known as yeast extract. This is a concentrate of the soluble components of yeast cells, produced by autolysis, a process by which the cell wall is induced mechanically or chemically to rupture. As well as being a nutritional supplement (by providing B vitamins), yeast autolysates have been shown to strengthen the immune system and decrease *E. coli* colonization in broilers and livestock which have sickened from ingesting mouldy feed.
Oxalic acid	For mite control in honeybee colonies.	This is strong organic acid, about 10,000 times stronger than acetic acid. This substance can be used either by the vapourizer method or the acid-sugar syrup solution drip method. The BC Ministry of Agriculture has a factsheet on Varroa Mite Control (Apiculture

Substance name(s)	Origin and usage	Guidance
		Factsheet # 221) which describes how to use this substance.
Oxytocin	For post-parturition therapeutic use. Meat from treated animals will not lose its organic status. *See* subclause 6.6.10 d) of CAN/CGSB-32.310, for criteria pertaining to the mandatory withdrawal period.	Oxytocin is a mammalian hormone, best known for its roles in female reproductive functions. It can simulate placenta cleaning and milk let-down. Oxytocin is not allowed to be used to stimulate labour for the convenience of the operator.
Paraffin	Shall be food-grade. For use in hives.	Paraffin wax is used as a preservative to protect the wood exterior of bee hives from the elements or to disinfect hive parts from a hive infected with American Foul Brood virus.
Parasiticides and anti-microbials	Shall respect requirements set out in Clause 6.6 of CAN/CGSB-32.310 with regard to the use of parasiticides.	Parasiticides are pesticides for the control of internal and external parasites. Anti-microbials are natural or synthetic drugs which inhibit or kill bacteria. The three main classes of anti-microbials are: - antibiotics which destroy organisms within the body and to which restrictions apply for their use (*see* 6.6.2, 6.6.10, 6.6.11 and 6.6.12) in 32.310); - disinfectants used on non-living surfaces; and - antiseptics used on living tissue. Anti-fungal medications, anti-virals, and anti-parasitics are also considered anti-microbials, as are natural compounds which have anti- microbial properties (e.g., essential oils).
Physical teat seals	All sources are permitted. Shall be free from antibiotics. For post-lactation use. Shall be completely removed prior to nursing or milking.	These aids prevent bacteria entering the teat canal at drying off. They reduce the incidence of mastitis and the need to use antibiotics for treatment. OrbeSeal is one example; it is not a medication.

Substance name(s)	Origin and usage	Guidance
	Shall be prescribed and administered under veterinary supervision.	
Plant oils	To control external parasites.	A list of plant oils and their uses in animal healthcare can be found at: www.organicfederation.ca/sites/documents/Animal%20Healthcare%20Products%20and%20Production%20Aids-%20final%20dec%202011.pdf
Prebiotics	From organic sources if commercially available.	Prebiotics are defined in Clause 3 of 310 as fibre foods and potential carriers for bacteria. These include inulin and oligosaccharides which can be extracted from plants such as Jerusalem artichoke, chicory and agave. They stimulate the growth of the beneficial bacteria (e.g., Bifidobacterium spp.).
Probiotics	Probiotics may be administered orally, as dietary supplements, via pharmaceutical preparations in the form of capsules, tablets, alginate gels, or dry powder.	Probiotics are micro-organisms (bacteria and yeasts) that provide health benefits when consumed. They help build immune systems to fight infection and increase the gut's ability to absorb nutrients. *Lactobacillus* spp. and *Bifidobacterium* spp. are the most common examples.
Propylene glycol	May only be used as an ingredient in foot baths.	Propylene glycol is not allowed for internal use, only in foot baths.
Sedatives	Such as xylazine.	Sedatives are allowed when carrying out permitted physical alternatives (*see* 6.6.4). Xylazine is just one example; other products (e.g., butorphanol) are allowed. All have withdrawal times twice that specified on the label or 14 days, whichever is longer.
Selenium products	Derived from sodium selenate or sodium selenite. May be used to address documented deficiencies in the stock, soils or feed supplies. *See* Table 5.3 Minerals, trace minerals, elements.	Selenium is an essential element for most animals. It may be used in this case as a nutritional supplement, but the operator would need to show that their farm soil, feed or animals are deficient in selenium. This could be accomplished from soil or plant analysis, or recommendations from a veterinarian.

Substance name(s)	Origin and usage	Guidance
		Injections of selenium can be given to newborn animals (particularly lambs) in areas with selenium-poor soil as a preventative measure to reduce the risk of white muscle disease.
~~**Sodium hydroxide**~~	For use in dehorning paste. *See* 6.4 of CAN/CGSB 32.310.	Until 2026, sodium hydroxide was permitted in dehorning paste. This is no longer permitted because using caustic paste for dehorning is no longer permitted because there are less painful alternatives for disbudding (or dehorning). Note that dehorning is considered a last resort. *See* 6.4 of CAN/CGSB-32.310.
Sulphur	For control of external parasites.	High concentrations (>5.3%) of sulphur solution have been shown to help eliminate northern fowl mites. Sulphur and lime sulphur are also used for mange and lice control in cattle.
Teat dips and udder wash	Substances, such as alcohol, iodine, hydrogen peroxide, chlorine dioxide and ozone, can be used as disinfectants for a pre- or post-teat dip or udder wash if they are registered for this use by Canada's Food and Drug Regulations. Chlorhexidine can be used as a post-milking teat dip if alternative germicidal agents and physical barriers have lost their effectiveness. *See* Table 5.3 Chlorhexidine.	
Thymol	*See* Table 5.3 Botanical compounds for thymol derived from botanical sources. Thymol that is not derived from botanical sources may only be used in foot baths.	Thymol made from the thyme plant is allowed for all uses. Synthetic forms of thymol that are produced in a lab, however, can only be used in foot baths.

Substance name(s)	Origin and usage	Guidance
Vaccines	Vaccines may be used in prevention of diseases. If vaccines compliant to subclause 5.1.2 of this standard are not commercially available, or are ineffective, vaccines not compliant to subclause 5.1.2 are permitted.	If there are no commercially available sources of non-GE vaccines, or if these are ineffective, GE sources can be used.
Vitamins	Vitamin formulants that comply with Canadian regulations are accepted, including those containing non-organic agricultural carriers. Vitamins not compliant to subclause 5.1.2 of this standard are permitted. Orally, topically or by injection.	Given the dominance of GE vitamins in the livestock feed supplement market, all forms of vitamins will be permitted, even genetically engineered forms.

6. Permitted Substances Lists for Preparation

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6. Permitted Substances Lists for Preparation

		Guidance
6.1	**Classification**	
6.1.1	Processing substances are classified according to the following uses and applications:	
6.1.1 a	Food additives (*see* definition in Clause 3 of CAN/CGSB-32.310);	A "food additive" is any substance that becomes a component of food (exceptions are listed in the Food and Drug Regulations) or otherwise affects the characteristics of food.
6.1.1 b	Other ingredients not considered to be food additives;	Whether a substance is listed in PSL Table 6.3, Ingredients classified as food additives, or Table 6.4, Ingredients not classified as food additives, consider it an "ingredient" for the purpose of its use in an organic product.
6.1.1 c	Processing aids (*see* definition in Clause 3 of CAN/CGSB-32.310).	Processing aids: *See* guidance to Clauses 9.2.1.b, 9.2.1.c, 9.2.2.c and 9.2.2.d of CAN/CGSB-32.310.
6.2	**Restrictions**	
6.2.1	Substances listed in Tables 6.3, 6.4 and 6.5 shall comply with prohibitions in Clauses 1.4 and 1.5 of CAN/CGSB-32.310. The following additional requirements apply to substances produced on substrates or growth media (for example, microorganisms and lactic acid):	Some ingredients permitted in organic production, such as citric acid, lactic acid and xanthan gum, are manufactured using microbial fermentation. The microorganisms used to drive the fermentation may be genetically engineered. The substrates or the growth media (broth) used in the fermentation may also contain genetically engineered components, such as glucose or sucrose derived from GE corn or sugar beets. The desired product (e.g., citric acid) is usually extracted and purified, allowing the leftover substrate materials to be reused in subsequent fermentation cycles. The higher the degree of purification, the less likely that there is substrate remaining in the product.
6.2.1 a	if the substance includes the substrates or growth media, the substrates or growth media ingredients shall be listed in Table 6.3, 6.4 or 6.5;	

		Guidance
6.2.1 b	if the substance does not include the substrates or growth media, the substance shall be produced on non-genetically engineered substrates or growth media, if commercially available.	To ensure that the PSL-listed substance is compliant based on its method of manufacture, your first step is to look for a product (e.g., citric acid) on the market that is not made with any GE organisms or contain GE ingredients (e.g., corn, soy, etc.). If these products contain any remnants of their production substrate or fermentation microorganisms, these remnants must be listed on PSL Tables 6.3-6.5. If a fully non-GE product is not commercially available, request and maintain documentation to that effect from the suppliers you contacted. If your selected product was produced on a GE substrate or used GE-microorganisms for fermentation, documentation must be maintained confirming that remnants of the substrate or fermentation microorganisms do not remain in the product that you will be using. For all substances listed in the PSL, the use of organic ingredients is preferred over the use of non-organic alternatives. However non-organic substances are allowed under certain circumstances. For PSL-listed substances that are ingredients or processing aids in a product that contains more ≥95% organic ingredients, follow the annotation instructions to use organic versions when they are commercially available. Other PSL-listed substances may not have this annotation even though organic forms of them are commercially available (such as gums). For PSL-listed substances that are ingredients or processing aids in a product containing 70- 95% organic ingredients, follow the annotation instructions.
6.2.2	Organic commercial availability requirements specified in the substance listing annotations of Tables 6.3, 6.4 or 6.5 apply to substances used in products composed of 95% or more organic content.	
6.2.3	Other commercial availability requirements specified in the substance listing annotations of Tables 6.3, 6.4 or 6.5 apply to substances used in organic products composed of 70% or more organic content.	

Table 6.3 - Ingredients Classified as Food Additives

Substance name(s)	Origin and usage	Guidance
~~**Acids**~~		The Acids listing was replaced by individual listings for various acids.
Alginic acid		Alginic acid: Used as a stabilizer and thickener in ice creams, puddings, flavoured milk drinks, pie fillings, soups and syrups
Antifoaming agents	*See* Table 6.5 Antifoaming agents.	
Activated charcoal	Shall be of plant origin. Prohibited for use in the production of maple syrup.	Also called activated carbon or activated coal, this form of carbon has been processed to make it extremely porous which makes it an effective filter. It is commonly used to filter impurities out of alcohol that could affect colour, taste or odour. It is also used in the decolourization process used in sugar refining. Bone char, while it is a form of "activated charcoal," is not permitted because it is not from plant sources.
Agar	*See* Table 6.3 Extraction solvents and precipitation aids.	A gelatinous substance derived from red seaweed. Used as an emulsifying, gelling, stabilizing or thickening agent. Sources must comply with any restrictions in the *Extraction solvents and precipitation aids* listing.
Alginates	The following alginates are permitted: a) alginic acid; b) potassium alginate; and c) sodium alginate.	Viscous gums produced by brown seaweed used as emulsifying, gelling, stabilizing or thickening agents. Alginates are effective at far lower concentrations than the animal-derived gelatine products that are commonly used.

Substance name(s)	Origin and usage	Guidance
Ammonium bicarbonate	As a leavening agent.	Produced by combining carbon dioxide and ammonia. Used as a leavening agent for flat baked goods such as cookies, crackers and Chinese steamed buns. Generates a slight ammonia smell during baking which quickly dissipates and leaves no taste.
Ammonium carbonate	As a leavening agent.	Produced by combining carbon dioxide and aqueous ammonia. Used as a leavening agent for flat baked goods, such as cookies and crackers. It also serves as an acidity regulator.
Argon		Argon is used in modified-atmosphere packaging (MAP) to displace oxygen inside food packaging (such as bags of coffee) in order to preserve freshness for retail sale.
Ascorbic acid (vitamin C)		Most commercial sources of ascorbic acid are extracted from a two-step bacterial fermentation of carbohydrate substrates, such as corn starch, corn sugar or rice. Such fermented sources meet the requirement of the standard if the organism is verified to be non-GE and the substrate restrictions in 6.2.1 are satisfied. Other commercial forms are chemically derived from a range of compounds, such as ascorbyl palmitate, calcium ascorbate, magnesium ascorbate, niacinamide ascorbate/nicotinamide ascorbate, potassium ascorbate and sodium ascorbate; these are permitted. Many uses in food production including the following: ● Bleaching, maturing and dough conditioning agent; ● Preservative (to retain texture, colour and flavour); and ● An anti-browning agent. Ascorbates (the mineral salts of ascorbic acid) are not the same as ascorbic acid and are not permitted.

Substance name(s)	Origin and usage	Guidance
Calcium carbonate	Prohibited for use as a colouring agent.	A mineral derived from the earth's limestone, marble or sedimentation of crushed marine shells. Calcium carbonate is the main component of egg shells. Used as an emulsifying, gelling, stabilizing, thickening, creaming, fixing, filling, carrying and pH-adjusting agent in various products. Used as food for yeast in brewing and making bread.
Calcium chloride	Permitted for: a) milk products; b) fat products; c) soybean products; d) fruits and vegetables: and e) beer brewing to adjust calcium level.	May be used as a firming agent for the product groups listed under calcium chloride. Di-basic: commonly used as a dough conditioner, also as a stabilizer, emulsifier, gelling or thickening agent for various cheese products. May be used in growth media (for fermentation-derived ingredients). Tri-basic: commonly used as an anti-caking agent, also as a conditioning agent and a yeast food in bread, an emulsifier, or anti-caking agent in dry powders (e.g., spices), as well a thickener, stabilizer and as a sequestering agent for certain dairy products.
Calcium citrate		Calcium citrate is the calcium salt derived from citric acid. Used in hard cheeses to promote enzyme activity and also as a dough conditioner in a variety of frozen foods (such as pizza or bread dough, waffles or cookies). Used as a firming agent and acidity-regulator in items such as gelatine, ice cream, carbonated beverages and jams, as well as evaporated, condensed and powdered milk.
Calcium phosphates		Food-safe forms are usually made from mined phosphate rock. Mono-basic: used as a leavening agent, dough conditioner, firming agent, pH adjuster and as sequestering agent for some dairy

Substance name(s)	Origin and usage	Guidance
(mono-, di-, and tri-basic forms)		products. Sometimes used in growth media (for fermentation-derived ingredients).
Calcium sulphate (gypsum)	Mined sources; calcium sulphate produced using sulphuric acid is prohibited.	Made from fine-grinding and air-separating mined sources of this mineral. Gypsum can be used to condition water used in brewing beer and to control the tartness and clarity of wine. Helps regulate acidity and improve the stability of a variety of foods including blue cheese, ice cream, canned vegetables, breakfast cereals, soy products, soups and baked goods.
Carbon dioxide (CO_2)	Carbonation of wine or mead is prohibited.	Taken from natural wells or captured as a byproduct of fermentation (wine, beer) or a byproduct of ammonia production. Used to make sparkling beverages. It is readily absorbed by many foods and consequently is not as popular as nitrogen for modified-atmosphere packaging (MAP).
Carrageenan (Irish moss)	Shall be derived using substances listed in Table 6.3 Extraction solvents and precipitation aids. By exception, isopropyl alcohol may be used to derive carrageenan.	Extracted from Irish moss red algae and commonly used as a food thickener and stabilizer.
Carriers	Carriers of non-agricultural origin may be used if listed on Tables 6.3, 6.4 or 6.5. Non-organic carriers of agricultural origin (such as wheat starch) may be used if ingredients or processing aids containing organic carriers are not commercially available.	Help disperse or deliver an ingredient within a product. For example, most enzyme preparations used in food processing contain carriers to help deliver and disperse the enzyme throughout the product.
Citric acid	From fruit and vegetable products or produced by microbial fermentation of carbohydrate substances.	Citric acid: citric acid must be concentrated from fruit, such as lemons, limes, blackberries, raspberries or tomatoes, or alternatively it may come from microbial fermentation of carbohydrate substances. Most commercial sources of citric acid are extracted

Substance name(s)	Origin and usage	Guidance
		from fungal fermentations of carbohydrate substrates, such as corn steep liquor, molasses or corn starch. Such fermented sources meet the requirement of the standard if the micro-organism is verified to be non-GE and the substrate restrictions in 6.2.1 are satisfied. Citric acid is mainly used as a pH adjuster (making food taste acidic or sour) or as an antioxidant to preserve food.
Colouring agents	From biological sources such as spices, annatto, juices made from plant sources, etc. derived using approved methods (*see* Table 12 B (1) and (2), Origin and mode of production of CAN/CGSB-32.310), and substances in Table 6.3 Extraction solvents and precipitation aids. May contain permitted carriers (*see* Table 6.3 & 6.4 Carriers).	Usually highly purified extracts from various fruits and vegetables. They are used to help: • Ensure product duplicability; • Offset product losses due to colour change from light, air, temperature extremes, moisture and storage conditions; • Provide identity to foods; and, • In some situations, protect flavours and vitamins from damage by light.
Dibasic ammonium phosphate (diammonium phosphate, DAP)	As a yeast and bacterial food for vinegar and alcohol production restricted to 0.3 g/L (0.04 oz/gal). Not to be added to a final vinegar or alcohol product.	Used for alcoholic beverages and vinegar to feed the yeast required for fermentation. Dibasic ammonium phosphate is also used to start secondary fermentation in the production of sparkling wines.
Enzymes	The following sources of enzymes are permitted: a) any preparations of enzymes normally used in food processing originating from edible, non-toxic plants, non-pathogenic fungi or non-pathogenic bacteria; b) originating from animals—shall be organic if commercially available: rennet; catalase from bovine liver; animal lipase; pancreatin; pepsin; and trypsin.	Enzymes are molecules that increase the rate of a chemical reaction. Almost all enzymes are proteins. Those used in food processing are derived from bacteria, fungi, higher plants or animals. The enzyme chymosin is the primary active ingredient in rennet, which is used to help cheese harden. Chymosin is either extracted from the stomach lining of calves or it is propagated by genetically engineered bacteria carrying inserted chymosin gene coding. Chymosin derived by GE technology is prohibited, while chymosin

Substance name(s)	Origin and usage	Guidance
	Animal-derived enzymes shall be free of Specified Risk Material (SRM); and c) egg white lysozyme.	extracted from calves is permitted. Chymosin from organic animals should be used if commercially available. Egg white lysozyme is an enzyme used to preserve foods, such as fresh fruits and vegetables, tofu, seafoods, meats and sausages, potato salad, and varieties of semi-hard cheeses, such as Edam, Gouda and some Italian cheeses.
Extraction solvents and precipitation aids	The following may be used to derive (extract) substances listed in Tables 5.2, 6.3, 6.4 and 6.5: a) water; b) culinary steam, as described in subclause 8.1.2 b) of CAN/CGSB-32.310; c) fats, oils and alcohols other than isopropyl alcohol; d) supercritical CO2; and e) substances listed in Tables 6.3, 6.4 or 6.5 of this standard. Precipitation aids derived from biological sources (such as plant proteins, albumin, casein, and gelatin) may also be used. In addition, non-biological precipitation aids, such as bentonite, silicon dioxide, etc., may be used if listed in Tables 6.3, 6.4 or 6.5. If listed in Tables 6.3, 6.4 or 6.5, precipitation aids shall meet any annotation restrictions therein.	These substances dissolve, dilute or extract a component, ingredient, food additive or other food without exerting any other effect on their own. There are references to this listing in many other substance listings to ensure consistency in the methods and products used to derive certain PSL-listed substances.
Gelatine	Shall be organic if commercially available. Gelatine may be sourced from: a) plants; or	Gelatine (also called gelatin) is made by extracting dried collagen hydrolysate from materials by curing, processing with acids or alkaline processing. The materials can be plants (including seaweed) or the by-products of meat or fish industries (e.g., pork skins, pork bones, cattle bones or fish skins).

Substance name(s)	Origin and usage	Guidance
	b) animals. If originating from cattle, gelatine shall be guaranteed free of Specified Risk Material (SRM).	Gelatine also can be prepared at home. Boiling certain cartilaginous cuts of meat or bones results in gelatine being dissolved into the water. Depending on the concentration, the resulting stock (when cooled) will form a jelly or gel naturally. This process is used for making aspic. Gelatine is used as a gelling agent in gelatin foods, marshmallows, most gummy candy, and certain ice creams, dips and yogurts. Plant-derived hypromellose is a non-agricultural substance sometimes used as a vegetarian alternative to gelatin. It is not specifically included in the PSL; therefore, it is not permitted.
Glucono delta lactone	Production by the oxidation of D-glucose with bromine water is prohibited.	Gluconic acid is found in honey, wine and rice, meat and vinegar. It is produced commercially by crystallization from an aqueous solution of gluconic acid. Used as a tofu coagulant; acidifier; agent to control pH control; and curing, pickling or leavening agent. When added to water, the taste is initially sweet, then it hydrolyzes to gluconic acid giving a slightly sweet, mildly acidic taste. In many foods, this is preferred to other acids that give stronger, more acidic tastes.
Glycerides (mono- and diglycerides)	From organic sources if commercially available. For use in drum drying of products.	Occur naturally as minor constituents of fats. Glycerides are prepared from fatty acids of animals or vegetables (soybean, canola, sunflower, cottonseed, coconut or palm oils). Used as an emulsifier to blend together certain ingredients, such as oil and water, which would not otherwise blend well. To make glycerides, a purée or slurry of food (such as milk, precooked cereals, fruit pulps, applesauce, gelatinized starch or honey) is added to one or two heated cylinders at varying feed rates depending upon viscosity. As the cylinders rotate, the slurry dries; this creates a

Substance name(s)	Origin and usage	Guidance
		powder that can serve as the basis for certain snacks, soups, baked chips, bakery items and cereals.
Glycerol (glycerine, glycerin)	Shall be from organic sources if commercially available. Shall be from vegetable oil or animal fat. Shall be produced using fermentation or by hydrolysis.	Commonly used as flavour carrier, colour carrier and/or thickener. Also used to improve textures and/or help retain moisture in a product. Also used as a stabilizer if the product contains a mixture of water and oil. Can be found in dairy products, including cheese, yogurt, powdered milk, powdered cream, condensed milk, whey products, clotted cream and dairy-based drinks.
Gums	The following gums are permitted: arabic gum, carob bean gum (locust bean gum), gellan gum, guar gum, karaya gum, tragacanth gum, and xanthan gum. Shall be derived using substances listed in Table 6.3 Extraction solvents and precipitation aids. By exception, isopropyl alcohol may also be used to derive gums.	These plant-based gums are commonly used to emulsify, gel, stabilize or thicken various foods. Many of these are commercially available in organic form, in which case producers are expected to use the organic form. Arabic: gum arabic, also known as acacia gum, is a natural gum made of the hardened sap of various species of the acacia tree. Carob bean (locust bean): locust bean gum is a galactomannan vegetable gum extracted from the seeds of the carob tree, mostly found in the Mediterranean region. Gellan: gellan gum is a water-soluble polysaccharide made by fermenting the bacteria *Sphingomonas elodea*. The result is an off-white powder that some companies use in place of agar agar as a vegan/vegetarian gelling agent for products such as gummy candies. Guar: guar gum is primarily derived from the ground endosperm of guar beans. The guar seeds are dehusked, milled and screened to obtain guar gum. It is typically produced as a free-flowing, off-white powder.

Substance name(s)	Origin and usage	Guidance
		Karaya: karaya gum comes from the Sterculia urens tree. It is traditionally tapped by cutting or peeling back the bark. Tragacanth: tragacanth gum is a viscous, odourless, tasteless, water-soluble mixture from the sap of goat's thorn or locoweed species. The gum seeps from the plant in twisted ribbons or flakes which can be powdered. Xanthan: Made by fermenting simple sugars with Xanthomonas campestris bacteria. The result is a slimy goo that is dried and ground into a fine white powder.
Kelp and kelp products	For use as a thickener and dietary supplement.	Large seaweed belonging to the brown algae group which is wild-harvested and dried.
Lactic acid		Lactic acid: Commonly known as "milk acid," although most commercial sources are created by bacterial fermentation of a carbohydrate like cornstarch, potatoes or molasses. Such fermented sources meet the requirement of the standard if the organism is verified to be non-GE and the substrate restrictions in 6.2.1 are satisfied. Lactic acid's main function is to adjust pH which can affect microbiological activity, cooking results and textures.
Lecithin	Shall be organic if commercially available. The bleached form is permitted if processed using food-grade hydrogen peroxide.	A source of choline, this yellow-brownish fatty substance is found in animal and plant tissues. Most commonly prepared from soybeans or eggs. Used as a releasing agent (also prevents sticking and reduces spattering during frying); an emulsifier (in chocolate and fat spreads); and an antioxidant.

Substance name(s)	Origin and usage	Guidance
Magnesium carbonate	As an anti-caking agent in non-standardized dry mixes (e.g., seasonings) used in meat products with 70-95% organic content.	Although there are mined sources of magnesite, most commercial products result from the reaction between any soluble magnesium salt and sodium bicarbonate. Only permitted for use as an anti-caking agent in spice mixes used in meat products containing 70-95% organic ingredients – not permitted in products that are ≥95% organic.
Magnesium chloride	Derived from seawater.	A white powder produced from seawater after the sodium chloride has been removed and the water has evaporated. Used primarily as a tofu coagulant. In Japan it is sold as nigari (meaning “bitter”).
Magnesium stearate	For use as an anti-caking or releasing agent in products whose contents are ≥70% and <95% organic ingredients.	Magnesium stearate is produced by the reaction of sodium stearate with magnesium salts or by treating magnesium oxide with stearic acid, although it may also be sourced from vegetable-derived stearic acid (keep in mind the need to avoid products made from genetically engineered crops). Only permitted for use as an anti-caking agent or releasing agent in products containing 70-95% organic ingredients – **not** permitted in products with ≥95% organic ingredients.
Magnesium sulphate		Used as brewing salt in beer production to adjust ion content of the brewing water, enhance enzyme action in the mash or promote a desired flavour profile. Also used as a coagulant in making tofu.
Malic acid		Malic acid is generated during fruit metabolism and occurs naturally in all fruits and many vegetables. For example, it is present in grapes and in most wines. It also contributes to the sourness of green apples. The taste of malic acid is very clear and pure in rhubarb;

Substance name(s)	Origin and usage	Guidance
		malic acid provides the primary flavour of rhubarb. Used as a flavour enhancer in a variety of foods, including hard and soft candies, sherbets and water ices, chewing gum, fruit preserves and bakery items with fruit fillings. Malic acid is added to soy yogurt to mimic the sour taste of traditional cow's milk yogurt.
Meat curing agents	Extracts, juice, or cultured powder of celery or chard are permitted. Shall be organic if commercially available.	High concentrations of nitrates are found in celery, lettuce, spinach and beets. Powder or juice from these vegetables can be fermented with a nitrate-reducing bacterial culture to produce nitrites. If commercially available, operators should use organic sources of celery or chard. Used in cured meat products, such as bacon, ham, hot dogs and bacon. As well as adding colour and flavour, nitrites help control pathogens and keep the fat from becoming rancid.
Ozone		Ozone is a highly reactive form of oxygen. It is a potent oxidant/ disinfectant that quickly decomposes to diatomic oxygen (O2), while reacting with targeted organic matter or micro-organisms. Used to purify drinking water, sterilize containers for aseptic packaging, decontaminate fresh produce, and preserve food in cold storage. Ozone is also useful in deodorizing air and water.
Pectin	High-methoxyl and low-methoxyl pectin sources are permitted.	A naturally-occurring polysaccharide found in many plants. Most commercial pectin is made from fruit (specifically citrus rind) or vegetables. It has traditionally been used to thicken jams and jellies. High-methoxyl pectin is the form of pectin traditionally used for canning applications. It requires high amounts of sugar to gel and is

Substance name(s)	Origin and usage	Guidance
		very sensitive to acidity. Low-methoxyl pectin has been used in the food industry to create low-sugar jams because it does not require high sugar levels to gel. It is also less sensitive to acidity and can be used as a fat substitute in baked goods and to stabilize acidic protein drinks such as drinking yogurt. Amidated versions of pectin are permitted.
Potassium acid tartrate ($KC_4H_5O_6$)	From grapes/wine-making.	Also known as potassium bitartrate and cream of tartar. It is a by-product of winemaking; it crystallizes in wine casks during the fermentation of grape juice. Potassium acid tartrate is used: ● To stabilize egg whites and whipped cream; ● As an anti-caking agent; ● As a thickening agent; ● To prevent sugar syrups from crystallizing; ● As a component of baking powder (as an acid ingredient to activate baking soda); and ● As a component of sodium-free salt substitutes in combination with potassium chloride. It can be confused with sodium acid pyrophosphate because of their common function as a component of baking powder.
Potassium carbonates (mono- and bi-)		Prepared commercially by the electrolysis of potassium chloride. Used as a pH adjuster. When added to cocoa powder, it balances the pH, enhances the aroma and darkens the colour – this is called the

Substance name(s)	Origin and usage	Guidance
		Dutch-process or “dutching.” Also can be used as a buffering agent in the production of mead or wine. Potassium bicarbonate is used as a source of carbon dioxide for leavening in baking, an additive in winemaking and a base in foods and to regulate pH. It is a common ingredient in club soda, where it is used to soften the effect of effervescence.
Potassium chloride	From mined sources, such as sylvite, carnalite and potash. Refer to the potassium chloride listing in Table 6.4 regarding potassium chloride in vinegar and alcohol production.	Occurs naturally as the mineral sylvite and is found combined in many minerals and in brines and ocean water. Potassium chloride can be found in beverages including coffee, herbal tea, tea, alcoholic beverages and cider. It is specifically permitted as a yeast food for ale, beer, light beer, malt liquor, porter and stout. Because potassium chloride is a key ingredient in certain salt substitutes, it is also found in many reduced-sodium foods, including certain canned soups. It is sometimes used to help gel or thicken artificially sweetened jellies and preserves. It is also used in artificial sweeteners, condiments, seasonings, broth, sauces, vinegar, mustard, deli salads, yeast and diet foods.
Potassium citrate		Potassium citrate is produced by adding potassium bicarbonate or potassium carbonate to a solution of citric acid until effervescence ceases; the solution is then filtered and the water allowed to evaporate. The resulting granulated substance is potassium citrate. Commonly used to adjust the pH of various foods which affects the

Substance name(s)	Origin and usage	Guidance
		microbiological activity, cooking results, textures and stability. Used in a wide variety of processed foods including beverages, syrups, pasteurized dairy products, processed vegetables, candies, pastas, processed rice products, condiments, seasonings and soups.
Potassium sulphite (bi-,meta-forms)	*See* Table 6.3 Sulphur dioxide, anhydrous (SO_2).	Potassium bisulphite has some different functions than potassium metabisulphite in wine making, but the main function of both is to stop the development of undesirable characteristics in the wine. Potassium bisulphite is permitted in the EU organic standards for winemaking.
Potassium phosphate (mono-, di-, and tribasic forms)	For use in products whose contents are ≥70% and <95% organic ingredients.	Only permitted for use in products with 70-95% organic ingredients – **not** permitted in products with ≥95% organic ingredients. Potassium phosphate is a generic term for the salts of potassium and phosphate ions. Used to help stabilize, thicken and regulate the acidity and moisture in foods. Used in large amounts in soft drinks, canned fish, processed meats, sausages, ham and baked goods. Many other processed foods may also contain added potassium phosphate.
Potassium tartrate ($K_2C_4H_4O_6$. INS 336)		Potassium tartrate is the potassium salt of tartaric acid and is often confused with potassium acid tartrate. It occurs naturally in many plants, particularly grapes, bananas and tamarinds. Potassium tartrate is one of the main acids in wine. It is used as a beer foaming agent; taste adjuster (adding sour flavour or masking other tastes); acidity regulator (in grape juices and wines); and an agent to slow down or prevent oxidation.

Substance name(s)	Origin and usage	Guidance
Silicon dioxide (silica)	No restrictions on sources or uses except for maple (*see* subclause 7.2.12.6 of CAN/CGSB-32.310).	Also known as silica, this substance is found in many plants, especially whole grains and certain fruits and nuts. Used primarily as a flow (anti-caking) agent in powdered foods or as a desiccant. Because of the nature of the process used to make this substance for commercial use, it is imperative to only use food- grade silicon dioxide for organic products.
Sodium acid pyrophosphate	For use as a leavening agent.	It is prepared by thermal dehydration of monosodium phosphate. Used to help create leavening properties in refrigerated dough products, such as frozen waffles, and in commercially prepared cake, pudding, waffle, pancake and muffin mixes.
Sodium bicarbonate (baking soda)		Made by either Solvay (using mined limestone) or Trona (using mined Trona ore) processes. Also known as bicarbonate of soda. Used in baking powder (as a pH regulator), as a leavening agent for baked goods, and as an anti-caking agent.
Sodium carbonate (soda ash)	If biological or mined sources are not commercially available, synthetic forms are permitted.	It can be extracted from the ashes of many plants growing in sodium-rich soils, such as vegetation from the Middle East, kelp from Scotland and seaweed from Spain. Because the ashes of these sodium-rich plants were noticeably different from ashes of timber (used to create potash), they became known as “soda ash.” It is synthetically produced in large quantities from salt (sodium chloride) and limestone by a method known as the Solvay process. Used as an acidity regulator, anti-caking agent, raising agent and stabilizer. Gives ramen noodles their characteristic flavour and texture, and is used in the production of sherbet powder.

Substance name(s)	Origin and usage	Guidance
Sodium chloride		Common table salt.
Sodium citrate		Possesses a saline or mildly tart flavour. Used as a buffering agent, stabilizer and antioxidant/preservative. Commonly known as sour salt.
Sodium hydroxide (lye or caustic soda)		Made through the electrolysis of an aqueous solution of sodium chloride. Extensive uses as a food additive (pH buffering agent, carbonating agent, heat stabilizer, softener and thickener) and as a processing aid (*see* Table 6.5 for restrictions on processing aid use).
Sodium phosphates	For use in dairy products.	Used as an emulsifier to prevent fat separation.
Sulphur dioxide, anhydrous (SO_2)	Sulphites from SO_2-bottled gas; as liquid SO_2; or liberated from ignition of asbestos-free sulphur wicks are permitted. Sulphurous acid (aqueous sulphur dioxide), Potassium bisulphite and potassium metabisulphite are also permitted. For use as a preservative in alcoholic beverages; minimal use of SO_2 is recommended. Maximum allowable levels of SO_2 in parts per million (ppm) are: a) in alcoholic beverages containing less than 5% residual sugar, 100 ppm and 30 ppm for total and free sulphites, respectively; b) in alcoholic beverages containing 5%-10% residual sugar, 150 ppm and 35 ppm for total and free sulphites, respectively; and	SO_2 prevents the growth of most wild micro-organisms and acts as a potent antioxidant protecting both the colour and flavours in wine. Wine yeast produces sulphur dioxide (SO_2) during fermentation, so it is almost impossible to make a sulphite-free wine; wines with no added sulphite usually contain 6 to 40 ppm of sulphite. Free SO_2 is the portion that is not bound with aldehydes (which are natural byproducts of fermented and unfermented sugars) or other oxidizable substances in the wine. Free SO_2 protects the wine from oxidation and microbial activity. Free SO_2 will disappear over time in wine, binding with the substrates mentioned above while simultaneously increasing the chance of spoilage as well. Higher levels of total and free sulphites are permitted in wines with higher sugar levels as it is not possible to produce these wines using

Substance name(s)	Origin and usage	Guidance
	c) in alcoholic beverages containing more than 10% residual sugar, 250 ppm and 45 ppm for total and free sulphites, respectively.	the same rates of SO_2 as table wines. This is because until all the binding partners (aldehydes) are saturated, there is no free sulphur available to protect the dessert wine from oxidization or bacterial spoilage. Potassium metabisulphite is a common wine or must additive that produces sulphur dioxide gas (SO_2). It can be used as an alternative to sulphur wicks and bottled SO_2 as it is safer, more readily available and easier to handle in smaller quantities.
Sulphurous acid	*See* Table 6.3 Sulphur dioxide, anhydrous (SO_2).	
Tartaric acid ($C_4H_6O_6$ INS 334)	From lees. For beverages.	Tartaric acid is a white crystalline acid that occurs naturally in many plants, most notably in grapes. It is added to beverages to impart its distinctive sour taste.
Tocopherols and mixed natural concentrates	Derived from vegetable oil when rosemary extract is not a suitable alternative.	Natural mixed tocopherols are a family of vitamin E compounds found in vegetable oils, nuts, fish and leafy green vegetables. Used to preserve the taste and prevent the oxidation or rancidity of many foods that contain oils and fats.
Vegetable oils	Shall be organic if commercially available. Derived using substances listed in Table 6.3 Extraction solvents and precipitation aids. Maple syrup production—vegetable oils shall be organic and without allergenic potential.	Historically, organic sources were not available for certain applications but now processors are expected to use organic vegetable oils.

Substance name(s)	Origin and usage	Guidance
Waxes, produce	Organic beeswax and organic carnauba wax may be used to wax produce. *See* subclause 9.2.1 d) of CAN/CGSB-32.310 if organic wax is commercially unavailable. For other wax uses, *see* Table 6.5 Waxes.	An example of a plant-based wax is carnauba wax, which comes from the leaves of a Brazilian palm. Organic waxes are preferred. Non-organic wax may be used if organic wax is not available, but the source must be confirmed to be non-GE, non-irradiated and not from cloned sources.
Yeast	If organic sources of yeast are not commercially available, these alternative sources of yeast may be used: a) autolysate; b) bakers' (may contain lecithin, as listed in Table 6.3); c) brewers'; d) nutritional; and e) torula. Growth on petrochemical substrate and sulphite waste liquor is prohibited. Yeast may be smoked or smoke-flavoured. When smoked, the smoke shall come from concentrated, condensed smoke from wood without additional ingredients (unless listed in Tables 6.3, 6.4 or 6.5).	Yeast are various single-cell fungi that mainly replicate through budding and are able to ferment carbohydrate substrates. Autolysate yeast: intense and distinctive extracts used to manufacture certain food products. Created by adding salt to a yeast suspension causing the yeast cells to shrivel further using its own enzymes to break down its proteins into simpler compounds. This process of self-destruction is known as autolysis. The dying yeast cells are then heated to complete their breakdown, after which the husks are separated (because the husks from yeast with thick cell walls would create a poor texture in the food product); Baker's yeast: the common name for the strains used as a leavening agent in baking bread and related products, where they convert the fermentable sugars present in the dough into carbon dioxide and ethanol; Brewers' yeast (also known as brewer's yeast or brewing yeast): can mean any live yeast used in brewing. Nutritional yeast: similar in appearance to brewers' yeast but has a nutty, cheesy, creamy flavour and is a dried by-product of brewing. Used as a dietary supplement for its B vitamin content. Smoked yeast (also known as bacon yeast or hickory-smoked yeast): yeast

Substance name(s)	Origin and usage	Guidance
		that has been smoked, giving it a bacon-like flavour. Used to flavour other dishes. Use organic forms of yeast when commercially available. If using non-organic strains, request documentation from your suppliers confirming the requirements regarding petrochemical substrate, sulphite waste liquor and, if it is a smoked yeast, details about the smoking process.
~~**Yeast**~~		The Yeast foods listing was replaced by two separate listings for Potassium chloride and Dibasic have been added.

Table 6.4 - Ingredients not Classified as Food Additives

Substance name(s)	Origin and usage	Guidance
Algal oil	*See* Table 6.4 Long-chain polyunsaturated fatty acids (LCPUFAs).	*See* Long-chain polyunsaturated fatty acids (LCPUFAs).
Amino acids	May be used if legally permitted for infant formula and formulated liquid diets to achieve the levels of proteins legally required.	
Carriers	Carriers of non-agricultural origin may be used if listed on Tables 6.3, 6.4 or 6.5. Non-organic carriers of agricultural origin (such as wheat starch) may be used if ingredients or processing aids containing organic carriers are not commercially available.	Help disperse or deliver an ingredient within a product. For example, most dough conditioners contain carriers to help disperse the enzyme throughout the dough.
Collagen casings	Collagen shall originate from animal sources. If derived from cattle, collagen shall be guaranteed free of Specified Risk Material (SRM). Other ingredients (such as, but not limited to: cellulose, calcium coatings, glycerin, etc.) added to collagen casings during their manufacture that remain in the collagen casing when it is used shall respect the requirement provided in Clause 1.4 a) of CAN/CGSB-32.310. Permitted for poultry sausage.	Collagen casings are permitted to be used in accordance with this annotation, but only for poultry sausages. No GE ingredients can be added while making the casings. Cellulose is intended for use only in the ways listed in the PSL; for example, it cannot be used as a flow agent in grated cheese.
Cultures	*See* Table 6.4 Microorganisms.	
Fatty Acids	a) Omega-3	

Substance name(s)	Origin and usage	Guidance
	b) Omega-6. Shall be organic if commercially available. Permitted for infant formulas to achieve the levels of fatty acids legally permitted.	
Flavours	Derived from biological sources using approved methods (*see* Table 12 B (1) and (2) Origin and mode of production of CAN/CGSB-32.310), and substances (*see* Table 6.3 Extraction solvents and precipitation aids). Includes alternative substances derived from biological sources that impart flavour including but not limited to acids and bases permitted by Table 12 B (3) in CAN/CGSB 32.310. May contain permitted carriers (*see* Table 6.3 and 6.4 Carriers).	Permitted flavours are made by concentrating plant, animal or micro-biological products (e.g., fruit, leaves, stem, bark, fungi, yeast, meat products, poultry products, dairy products, fermented products, etc.). Most are extracted by water or alcohol, or generated through distillation or fractionation. Carriers are restricted according to the Carriers listing in this table. Artificial flavours, which are chemically modified in a way that makes them different from their natural chemical state, are prohibited. Flavours are used to: ● Help ensure product duplicability; ● Provide identity to foods; and ● Offset loss due to light, air, extremes of temperature, moisture and storage conditions.
Long-chain polyunsaturated fatty acids (LCPUFAs)	Docosahexaenoic acid (DHA) from algal sources; Arachidonic acid (ARA) from fungal sources. Shall be organic if commercially available. Permitted for infant formulas to achieve the levels of fatty acids legally permitted.	With the addition of aquaculture ingredients (9.1.2), along with the change to the definitions of agricultural ingredients and 'derived from biological or mineral sources', docosahexaenoic acid (DHA) from algal sources and (arachidonic acid) ARA ingredients from fungal sources are permitted for use within the non-organic 5% content of infant formulas. This allowance aligns with the EU and the US organic regulations allowing Canadian products to be made for export. Up to this point organic infant formula containing these ingredients were being imported to Canada from the US or EU, but not made in Canada.

Substance name(s)	Origin and usage	Guidance
		Additionally, addition of DHA to organic infant formula is mandatory for products made for the EU market.
Microorganisms	Microbial preparations may contain substrates made from agricultural substances or derived from biological substances such as milk, lactose, soy, agar, etc. May also contain permitted carriers (*see* Table 6.3 and 6.4 Carriers). Includes starter and dairy cultures and other preparations of microorganisms normally used in product processing.	Dairy cultures: Micro-organisms especially selected and developed for their use in dairy manufacturing including bacteria, yeasts and moulds. They may not be products of genetic engineering or from cloned animals. Micro-organisms (processing derivatives): Bacteria, fungi and other micro-organisms used in brewing, winemaking, baking, pickling and the production of dairy products such as yogurt and cheese. Not only can micro-organisms add characteristic flavours and aromas, but some can inhibit the growth of undesirable organisms. They may not be products of genetic engineering.
Nitrogen	Shall be food-grade quality.	Nitrogen is separated from atmospheric air. May be from a purchased source or generated on site. Used to: • Slow down the growth of aerobic life forms and the speed of oxidation reactions; • Maintain the taste profile of beer, wine, juice and other beverages; • Dispense draft beer; and • Provide a pressurized dry atmosphere that prevents package collapse for delicate foods like chips and crackers.
Oxygen		Oxygen is separated from atmospheric air. Used in combination with other gases in controlled atmosphere storage.

Substance name(s)	Origin and usage	Guidance
Potassium chloride	From mined sources such as sylvite, carnalite, and potash. May be used for all types of food production, including as food for yeast and bacteria in vinegar and alcohol production.	
Potassium iodide	Shall be used when legally required or permitted.	Can be extracted from salt brine. Occurs naturally in kelp, which contains 0.4 to 1.3% of iodine in the form of iodide salts such as potassium iodide. Normally added to table salt in small quantities to make it “iodized.”
Salt	Substances listed in Tables 6.3 or 6.4 may be added to mined or sea salt. *See* Table 6.3 Sodium chloride; Potassium chloride. *See* definition of Salt in clause 3 of CAN/CGSB-32.310.	Including sodium chloride, low-sodium and sodium-free substitutes. Provides salt flavour, nutrition or microbial control.
Smoke flavour	*See* Table 6.3 Yeast.	Artificial smoke flavour is not permitted. Only yeast, such as torula yeast, may be smoked. The smoked yeast can provide nutrition and flavour to foods (often vegetarian foods).
Starch	From rice and waxy maize—Shall be derived using substances listed in Table 6.3 Extraction solvents and precipitation aids, where applicable. Starch shall not be modified by chemicals. Starch may be modified using physical or enzymatic methods. Cornstarch— If organic cornstarch is not commercially available, non-organic may be used and may contain substances that are plant-derived or listed in Tables 6.3, 6.4 or 6.5.	Shall be organic if commercially available. If organic starch is not available, only non-organic rice or waxy maize starches meeting the requirements of the Extraction solvents and precipitation aids listing are permitted. Native starch is the granular starch component recovered from the original plant source by extraction, milling, wet grinding, washing, sieving and drying. Keep in mind that starch made from genetically engineered crops cannot be used.

Substance name(s)	Origin and usage	Guidance
		Used as thickeners and stabilizers in foods (such as puddings, custards, soups, sauces, gravies, salad dressings) and to make noodles and pasta.
Vitamins and mineral nutrients	Shall be used if legally required (e.g., fluid milk, white flour, infant formula, meal replacement, etc.). 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. Ferrous sulphate—Shall be used if legally required and may be used, on a voluntary basis, if legally permitted.	A vitamin is an organic compound required as a nutrient in tiny amounts that cannot be made in sufficient quantities by an organism and must be obtained from the diet. A mineral refers to an inorganic compound necessary for life and good nutrition. These can be naturally occurring in food or added in elemental or mineral form to food. These products may contain non-agricultural sub-parts not listed in the PSL. These are permitted as long as the non-agricultural sub-parts do not have an effect on the final product (within which the vitamin or mineral nutrient is used as an ingredient) and they are declared on the final organic product label (9.1.2 of 32.310). Ferrous sulphate: an astringent iron salt added to replace iron lost in processing. Calcium compounds and Vitamin C (ascorbic acid) can be added to foods such as orange juice if they are used as stabilizers and preservatives. However, vitamins and calcium wouldn't be allowed if they were added for nutritional fortification because they are not "legally required" in juice and juice is not a non-dairy substitute like almond or oat milk for example. Juice is categorized as a voluntary fortification option by the Canadian Food & Drug Regulations. Refer to CFIA's "Foods to Which Vitamins, Mineral Nutrients and Amino Acids May or Must be Added."

Substance name(s)	Origin and usage	Guidance
Yeast	If organic sources of yeast are not commercially available, these alternative sources of yeast may be used: a) autolysate; b) bakers' (may contain lecithin, as listed in Table 6.3); c) brewers'; d) nutritional; and e) torula. Growth on petrochemical substrate and sulphite waste liquor is prohibited. Yeast may be smoked or smoke flavoured. When smoked, the smoke shall come from concentrated, condensed smoke from wood without additional ingredients (unless listed in Tables 6.3, 6.4 or 6.5).	*See* guidance for Yeast in Table 6.3.

Table 6.5 - Processing Aids

Substance name(s)	Origin and usage	Guidance
Acer pennsylvanicum	As an anti-foaming agent in maple syrup production.	Also known as striped maple, Pennsylvania maple wood or moosewood. When maple sap boils, foam accumulates on the surface of the boiling sap. Foaming can be reduced by adding Pennsylvania maple wood to the boiling sap, which reduces the need to skim excess foam off the surface of the boiling sap for disposal. For more details on maple syrup processing, refer to 7.2 Maple Products.
Alginic acid		*See* guidance in Table 6.3.
Antifoaming agents	Shall be composed of organic ingredients. May contain permitted substances (Tables 6.3 and 6.5).	
Citric acid	From fruit and vegetable products or produced by microbial fermentation of carbohydrate substances	*See* guidance in Table 6.3.
Lactic acid		*See* guidance in Table 6.3. Lactic acid can be used as a carcass wash under the standard as a cleaner, however carcass washes are classified as processing aids by CFIA.
Activated charcoal	Shall be of plant origin. Prohibited for use in the production of maple syrup.	*See* guidance in Table 6.3.
Alcohol, ethyl (ethanol)	Shall be organic if commercially available.	Also called pure alcohol, grain alcohol, or drinking alcohol. Is a volatile, flammable, colourless liquid that can be mixed with water

Substance name(s)	Origin and usage	Guidance
		and is therefore a good solvent or carrier for flavours, colours and tinctures.
Argon		*See* guidance in Table 6.3.
Ascorbic acid (vitamin C)	For use as an anti-browning agent prior to the extraction or concentration of fruit or vegetable juice.	*See* guidance in Table 6.3.
Bentonite		A mined clay product. Used as a filtering medium. Bentonite has a unique property of adsorbing relatively large amounts of protein molecules from aqueous solutions. In this way, it helps keep white wines free from getting cloudy in warm temperatures. It also induces more rapid clarification of both red and white wines.
Calcium carbonate		Calcium carbonate is a mineral derived from the earth's limestone, marble or sedimentation of crushed marine shells. It is the main component of eggshells. Used in cocoa processing and as a processing aid to bleach flour.
Calcium hydroxide (lime)		Commonly used to produce corn flour (masa) through nixtamalization. Nixtamalization is the soaking and cooking of whole corn grains in a lime solution resulting in the separation of the outer hull from the inner grain. The resulting grain can then be effectively dried and ground increasing the availability of both protein and vitamins. The production of sugar from both sugar cane and sugar beets also requires the addition of calcium hydroxide, as the raw juices are low in pH and contain dissolved impurities. Hydrated lime is added to the juice to raise the pH and to react with the impurities to form insoluble calcium organic compounds that can be removed.

Substance name(s)	Origin and usage	Guidance
Calcium sulphate (gypsum)	Sulphates produced using sulphuric acid are prohibited. May be used: a) as a carrier for cakes and biscuits; b) for soybean products; and c) for bakers' yeast.	The processing aid is made from fine-grinding and air-separating mined sources of the mineral. Note that this annotation is different than the ingredient listing in Table 6.3. As a processing aid, it is only permitted for the uses described in the annotation.
Carbon dioxide (CO_2)		Taken from natural wells or captured as a by-product of fermentation processes (wine, beer) or ammonia production. Used in modified atmosphere packaging to displace oxygen, lower the pH and inhibit bacterial growth. Liquid carbon dioxide can be used in the decaffeination process of coffee beans.
Carrageenan (Irish moss)	Derived using substances listed in Table 6.3 *Extraction solvents and precipitation aids.*	Extracted from Irish moss red algae. Used as a clarifying agent in alcoholic beverages.
Casein	Shall be from organic sources if commercially available. Non-organic casein shall be derived from the milk of animals not treated with rBGH (recombinant bovine growth hormone).	Casein is a milk protein also known as caseinogen. Commonly used as a binding agent as it is not susceptible to denaturing when exposed to high heat or acid.
Chlorine compounds	*See* Table 7.3 Chlorine compounds.	
Clay dust	As a filtering agent in maple syrup production.	
Cellulose	As a filtering aid (non-chlorine bleached) and for use in inedible regenerative sausage casings.	From plant fibres. Cellulose cannot be used in any ways other than the ones listed in

Substance name(s)	Origin and usage	Guidance
	The TCF (Totally Chlorine Free) method of bleaching is permitted.	the PSL; for instance, it cannot be used as a flow agent in grated cheese. The manufacturing of non-chlorine bleached cellulose using the Totally Chlorine Free (TCF) method of production was determined to be environmentally sound and comply with organic standards. But operators need to check that the raw source of cellulose is from non-GE sources (32.310 1.4 a).
Diatomaceous earth	As a food filtering aid or as a clarifying agent.	Diatomaceous earth is also known as DE, diatomite, kieselgur or kieselguhr. Consists of the fossilized remains of diatoms, a type of hard-shelled algae. Their hard shells are made from soluble silica (sand) in their marine environment. Used to filter beer and wine. Also can filter wine, syrups, sugar and honey without removing or altering their colour, taste or nutritional properties.
Enzymes	The following sources of enzymes are permitted: a) any preparations of enzymes normally used in food processing made from edible, non-toxic plants, non-pathogenic fungi or non-pathogenic bacteria; b) originating from animals—shall be organic if commercially available: rennet; catalase from bovine liver; animal lipase; pancreatin; pepsin; and trypsin. Animal-derived enzymes shall be free of Specified Risk Material (SRM); c) egg white lysozyme.	*See* entry in Table 6.3.
Gelatine	Shall be from organic sources if commercially available.	*See* entry in Table 6.3.

Substance name(s)	Origin and usage	Guidance
	Permitted sources are: a) plants; and b) animals. Animal gelatine may be used in preparations of canned meat or as a gelling agent for gummed candy. If originating from cattle, gelatine shall be guaranteed free of Specified Risk Material (SRM).	
Hydrogen peroxide	Food-grade. For use as a bleaching agent for proteins and starches.	There are many grades of hydrogen peroxide and the food-grade label does not mean this product can be ingested. Follow product instructions when handling food-grade hydrogen peroxide: this is a highly reactive product.
Isinglass	As a fining agent (fish-based).	Isinglass is derived from the swim bladder of fishes and is an excellent source of high-quality collagen (protein). Used mainly as a clarification (fining) agent for beer and wine.
Kaolin	As a clarifying agent.	Kaolin is a type of clay similar to bentonite. Used to remove solid matter that causes cloudiness in a liquid.
Lecithin	Shall be organic if commercially available. Bleached form is permitted if processed using food-grade hydrogen peroxide.	*See* entry in Table 6.4.
Nitrogen	Shall be food-grade quality.	*See* entry in Table 6.4.
Oxygen		*See* entry in Table 6.4.
Ozone		Ozone is a highly reactive form of oxygen. It is a potent oxidant/disinfectant that quickly decomposes to diatomic oxygen (O2) while reacting with targeted organic matter or micro- organisms.

Substance name(s)	Origin and usage	Guidance
		Used to purify drinking water, sterilize containers for aseptic packaging, decontaminate fresh produce, and preserve food in cold storage. Ozone also is useful in deodorizing air and water.
Peracetic acid		Adding peracetic acid (which is also in Table 7.3) to Table 6.5 makes it easier for meat processors given that carcass washes are classified as processing aids by CFIA.
Perlite	For use as a filtering aid.	Perlite is a generic name for naturally occurring siliceous volcanic rock that expands up to 20 times its original volume when it is heated to its softening range. Perlite filter aids do not impart taste, colour or odour to the liquids being filtered.
Potassium carbonate		Potassium carbonate is prepared commercially by the electrolysis of potassium chloride.
Potassium hydroxide (caustic potash)	For pH adjustment. Prohibited for use in lye peeling of fruits and vegetables.	Potassium hydroxide and sodium hydroxide are often used interchangeably, but sodium hydroxide tends to be less costly and hence preferred. Used in chocolate and cocoa processing, caramel colour production, and soft drink processing.
Silicon dioxide (silica)	No restrictions on sources or uses except for maple (*see* 7.2.12.6 of CAN/CGSB-32.310)	*See* entry in Table 6.3.
Sodium bicarbonate (baking soda)		*See* entry in Table 6.3.
Sodium hydroxide	Prohibited for use in lye peeling of fruits and vegetables.	Sodium hydroxide is made through the electrolysis of an aqueous solution of sodium chloride.

Substance name(s)	Origin and usage	Guidance
(lye or caustic soda)		Used to soften olives or soak dried corn kernels to make hominy, corn nuts or grits. German pretzels are poached in cold sodium hydroxide solution before baking which contributes to their unique crust. *See* the Potassium hydroxide (caustic potash) listing for more information.
Talc	As a filtering agent.	Talc is a clay mineral composed of hydrated magnesium silicate. Commonly used a filtering aid for olive oil.
Tannic acid	Shall be from an organic source if commercially available. Shall be derived using substances listed in Table 6.3 Extraction solvents and precipitation aids. Permitted as a filtration aid for wines.	Tannic acid is a specific commercial form of tannin which is a type of polyphenol. Usually extracted from tara pods, gallnuts or Sicilian sumac leaves. Used as a clarifying agent for wine.
Tartaric acid ($C_4H_6O_6$ INS 334)	From lees. For beverages.	*See* entry in Table 6.3.
Vegetable oils	From organic sources if commercially available. Derived using substances listed in Table 6.3 Extraction solvents and precipitation aids. Maple syrup production—vegetable oils shall be organic and without allergenic potential.	In certain applications, such as oils in spray form to be used as release agents, organic sources may not be commercially available. Given the widespread availability of organic vegetable oil, non-organic oils can only be used in certain specialized applications where there are no organic sources available commercially. In these situations, for example when an organic vegetable oil spray cannot be sourced, a non-organic oil spray can be used only if it was derived using the *Extraction solvents and precipitation aids* listed in Table 6.3.
Waxes	If organic waxes, such as beeswax or carnauba, are not commercially available, waxes derived from non-organic	Carnauba comes from the leaves of a Brazilian palm.

Substance name(s)	Origin and usage	Guidance
	biological sources may be used. Edible wax cheese coatings that require a knife to cut or peel the wax away shall not contain paraffin, microcrystalline wax, non-listed preservatives, colours, bactericides or fungicides. Non-edible, fully removable (i.e., no knife is needed to cut or peel the wax away from the cheese), non-organic cheese wax may be used and shall be considered packaging per subclause 8.1.6 of CAN/CGSB-32.310. For waxes applied to produce – *see* Table 6.3 Waxes, produce	

7. Permitted Substances Lists for Cleaners, Disinfectants and Sanitizers

COG
Canadian Organic Growers
Cultivons Biologique Canada

OFC FBC
ORGANIC FEDERATION OF CANADA
FÉDÉRATION BIOLOGIQUE DU CANADA

7. Permitted Substances Lists for Cleaners, Disinfectants and Sanitizers

		Guidance
7.1	**Classification**	
7.1.1	The cleaners, disinfectants and sanitizers listed below are used to remove dirt, filth and foreign matter from organic products and organic product contact surfaces. These substances are also used to control microorganisms that may contaminate products. The use of these substances may require a removal event, as defined in Clause 3 of CAN/CGSB-32.310.	Table 7.3 applies to organic products, and Tables 7.3 and 7.4 apply to product contact surfaces. For cleaning other surfaces (such as floors and windows), these listed substances are preferred but are not required to be used. If substances listed in Tables 7.3 and 7.4 are not sufficient for the operator's needs, verify that the requirements in CAN/CGSB-32.310 Clause 8.2.3 have been followed. *See* the guidance for 7.1.2 for details about removal events.
7.1.2	They are classified as follows:	"Without a mandatory removal event" means that an operator is not required to wash the substance off after its use. The substance is allowed to dry on the surface. "Mandatory removal event" generally entails rinsing with potable water or purging with organic product after using these cleaning, disinfecting, or sanitizing products. Air drying is another acceptable mandatory removal event if applicable. Operators are expected to be able to demonstrate that the substance used was in fact removed from the product contact surface prior to an organic production run. In some cases, this means that operators will be expected to use a testing methodology to document its removal (such as a residue test strip).
7.1.2 a	food-grade cleaners, disinfectants and sanitizers permitted without a mandatory removal event;	
7.1.2 b	cleaners, disinfectants and sanitizers permitted on organic product contact surfaces, for which a removal event is mandatory prior to an organic production load or run.	

		Guidance
7.1.3	All non-organic ingredients listed on Safety Data Sheets (SDS) and active ingredients listed on the label of formulated cleaners, sanitizers and disinfectants shall be listed in Tables 7.3 or 7.4. Other non-organic ingredients used without a removal event shall be limited to substances listed in Table 7.3; water; compounds used to treat drinking water; and product stabilisers, such as HEDP (1-hydroxyethane 1,1-diphosphonic acid) or dipicolinic acid, whose function is to prevent the chemical degradation of substances listed in Table 7.3. Table 7.4 compliant products may contain non-active ingredients, including, but not limited to, dyes, fragrances, and chemical agents used to prevent physical separation of foams or emulsions.	To assess if the ingredients of a cleaning, sanitizing or disinfecting product are compliant (i.e., permitted): • If used directly on organic food, feed or product contact surfaces without a removal event, compare all non-organic ingredients listed on the product's SDS including formulants and the active ingredients listed on the label to make sure they are either (i) on PSL Table 7.3, (ii) are chemicals used to treat drinking water, or (iii) serve as product stabilizers. • If used on organic food-contact surfaces followed by a removal event, verify that all ingredients (including formulants if listed on the SDS) are listed in PSL Table 7.3 or 7.4. If they are not listed in PSL Table 7.3 or 7.4, the criteria described in 8.2.3 of CAN/CGSB-32.310 must be met in order for that product to be used in organic production.
7.1.4	Substances listed in Tables 7.3 and 7.4 are not subject to Clauses 1.4 or 1.5 of CAN/CGSB-32.310.	In organic production and processing, genetically engineered (GE) organisms are avoided as much as possible. However, organic operators do not have to check the GE status of any biological or fermented components contained in cleaners, disinfectants or sanitizers as long as the substances contained in these products are listed in Table 7.3 or 7.4.
7.2	Clause 7 does not apply to maple syrup production. The operator shall meet the specific requirements for the different stages of production as described in Clause 7.2 of CAN/CGSB 32.310.	Maple producers should refer only to Clause 7.2 in CAN/CGSB-32.310 for cleaning requirements.

Table 7.3 - Food-grade Cleaners, Disinfectants and Sanitizers Permitted Without a Mandatory Removal Event

Substance name(s)	Origin and usage	Guidance
Acetic acid	May be used on organic product contact surfaces. May be used on organic products if produced by microbial fermentation of natural carbohydrate sources (sugars, wood, etc.). Example: apple cider vinegar. May be filtered or unfiltered.	Acetic acid (the main component of vinegar) is produced industrially using two different methods; 75% by carbonylation of methanol, the rest by bacterial fermentation. Commonly used as an antimicrobial agent, acetic acid can be used to rinse or clean organic produce if the acetic acid is made from a fermented biological source and a removal event is not required. The carbonylated form, when carbon monoxide is injected into the solution during the manufacturing process, may not be used on organic product but may be used on product contact surfaces. A removal event is not required. Organic operators do not have to check the GE status of any biological or fermented components contained in any cleaners, disinfectants, sanitizers as long as the substances contained in these products are listed in Table 7.3 or 7.4.
Alcohol, ethyl (ethanol)	May be used on organic product contact surfaces.	This water-soluble chemical compound is effective against fungi, bacteria (in their growth phase but not spores), Mycobacterium, and certain viruses, including Norovirus. It is most effective at a concentration of 60%-90% in water. Activity drops sharply when diluted below a 50% concentration.
Alcohol, isopropyl	May be used on organic product contact surfaces.	Also known as rubbing alcohol, this is an effective disinfectant against bacteria, viruses and fungi but not effective against spores.

Substance name(s)	Origin and usage	Guidance
		This is most effective at 60%-90% in water. Activity drops sharply when diluted below 50% concentration.
Alcohol, organic sources		Effective against fungi, vegetative bacteria (i.e., bacteria in their growing states), Mycobacteria and some viruses, including norovirus (but not effective against spores). Most effective at 60%-90% in water. Activity drops sharply when diluted below 50% concentration.
Ascorbic acid (vitamin C)		Most commercial sources are extracted from a two-step bacterial fermentation of a carbohydrate substrate, such as corn starch, corn sugar or rice. Other sources of ascorbic acid are chemically derived from ascorbyl palmitate, calcium ascorbate, magnesium ascorbate, niacinamide ascorbate/nicotin-amide ascorbate, potassium ascorbate, sodium ascorbate. Fermented and chemically derived sources may be used as cleaners, disinfectants or sanitizers. Organic operators do not have to check the GE status of biological or fermented components contained in any cleaners, disinfectants, sanitizers if the substances in these products are listed in Table 7.3 or 7.4. Ascorbates (the mineral salts of ascorbic acid) are not the same as ascorbic acid and are not permitted.
Carbon dioxide (CO_2)		CO_2 is part of the new age cleaning toolkit. It is used to clean objects from large equipment to delicate hard drives and optics. Various phases, including solid dry ice pellets, liquid CO_2, CO_2 snow (dry-liquid hybrid) and supercritical CO_2, may be used to clean organic products and contact surfaces.

Substance name(s)	Origin and usage	Guidance
Chlorine compounds	The following chlorine compounds are permitted: a) calcium hypochlorite; b) chlorine dioxide; c) hypochlorous acid generated via electrolyzed water; d) sodium hypochlorite. Chlorine compounds may be used: a) for wash water in direct contact with crops or food; b) in flush water from cleaning irrigation systems, equipment, storage or transport units—application to crops or fields is permitted. Shall not exceed the maximum level of chlorine in potable water, as per the *Guidelines for Canadian Drinking Water Quality* published by Health Canada, as well as any applicable provincial requirements.	Used to kill bacteria and disinfect. Used to treat pasteurizer cooling water, washing fruit, vegetables and poultry carcasses, and to disinfect product contact surfaces. Chlorine mixed with calcium is usually in granular or tablet form (calcium hypochlorite) and when mixed with sodium is a liquid bleach (sodium hypochlorite). Hypochlorous acid (HCIO) in water releases hypochlorite (CIO-). Chlorine may also be available as chlorine dioxide although hypochlorites are the most active of the chlorine compounds. Drinking water guidelines vary by province; typical chlorine levels in Canadian drinking water distribution systems range from 0.04 to 2.0 mg/L. (Note 1 mg/L equals 1 ppm). Operators should consult their provincial regulatory bodies. In the application of this standard, certifying bodies should require a water test of all crop or product wash water that contains chlorine compounds to confirm drinking water levels. The requirements also apply to water applied to crops or flush water applied to fields. Electrolyzed water (which may contain hypochlorous acid as a byproduct of either electrolysis or from the dissolution of chlorine compounds in water) is permitted.
Citric acid		Common commercial sources are produced industrially in cultures of *Aspergillus niger*, which are fed on a medium that contains sucrose or glucose. The source of sucrose or glucose is typically corn steep liquor, molasses, corn starch or other inexpensive sugary solutions. Organic operators do not have to check the GE status of any biological or fermented components contained in any cleaners,

Substance name(s)	Origin and usage	Guidance
		disinfectants, sanitizers as long as the substances contained in these products are listed in Table 7.3 or 7.4. Used as a component of fruit and vegetable wash products
Glycerol (glycerine, glycerin)	May be used on organic product contact surfaces, including hands. May be used on organic products if sourced from vegetable oil or animal fat; and produced using fermentation or by hydrolysis.	Used as a stabilizer of cleaning products that contain a mixture of water and oils. Operators can use personal care products and other cleaning products containing glycerol without having to research for a restricted source, as is required for glycerol used as a food additive (Table 6.3).
Hydrogen peroxide		There are many grades of hydrogen peroxide. Food-grade hydrogen peroxide at 3% concentration is the most common for use as a sanitizing agent. Note that the food-grade label does not mean this product can be ingested. Follow product instructions when handling food-grade hydrogen peroxide— this is a highly reactive product.
Lactic acid		Commonly known as “milk acid,” but most commercial sources are created by bacterial fermentation of a carbohydrate such as cornstarch, potatoes or molasses. Its main function is to adjust pH which can affect microbiological activity, cooking results and textures.
Magnesium sulphate		Contained in many commercial detergents, liquid soaps and rinsing agents to regulate viscosity. Can be used as an inexpensive abrasive scrub.
Microorganisms	Living or dead biological organisms, such as viruses, phages, bacteria, protozoa, fungi, etc.	The new frontier in cleaning: Much research is being undertaken regarding the use of beneficial microorganisms that can outnumber harmful microorganisms on surfaces and how this may become a new frontier in food safety protocols. The goal is to populate surfaces

Substance name(s)	Origin and usage	Guidance
		repeatedly with good living microorganisms and they will eventually outnumber the harmful microorganisms as the harmful ones die off naturally.
Non-ionizing radiation	May be used to manage pest loads on product and product contact surfaces, including facilities, equipment, and empty hives. Non-ionizing radiation is defined in Clause 3 of CAN/CGSB 32.310 in the Terms and Definitions.	*See* guidance for "Non-ionizing radiation" in Table 4.2.
Ozone		Ozone is a highly reactive form of oxygen. It is a potent oxidant/disinfectant that quickly decomposes to diatomic oxygen (O2) while reacting with organic matter or micro-organisms. Used to purify drinking water, sterilize containers for aseptic packaging, decontaminate fresh produce and preserve food in cold storage. Ozone can also deodorize air and water.
Peracetic (peroxyacetic) acid	On food and plants: peracetic acid may be used in wash or rinse water. Peracetic acid may also be used on food contact surfaces.	Peracetic acid is a chemical in the organic peroxide family. It is a good anti-microbial agent due to its high oxidizing potential. Peroxyacetic acid is effective against a broad spectrum of coliforms, bacteria, yeast and moulds. It is effective at temperatures from 5C to 40C and at a pH up to 8.0. It breaks down to acetic acid (vinegar), water, oxygen and carbon dioxide. There are no restrictions on the method of production for peracetic acid itself. Some commercial peracetic acid products are fortified with non-listed substances (e.g., quaternary ammonia). These would be prohibited for use unless they meet the criteria described in 8.2.3 of CAN/CGSB-32.310. Used most commonly in fresh-cut, further processed, and post-harvest fruit and vegetable flume and wash water systems, especially where high levels of organic matter could significantly

Substance name(s)	Origin and usage	Guidance
		decrease the effectiveness of chlorine. It is also commonly used in poultry chill tanks and to wash red meat carcasses. Different formulations are designed to be used directly on whole and processed fruit and vegetable surfaces, on food and non-food contact surfaces, and in clean-in-place (CIP) systems. Rinsing is generally not required.
Potassium bicarbonate	On organic product contact surfaces.	
Sodium bicarbonate (baking soda)		Made via either the Solvay (using mined limestone) or Trona processes using mined Trona ore. Also known as bicarbonate of soda. Sodium bicarbonate is an effective scouring agent when mixed with water. It helps to lift baked-on cooking residues by interacting with acids in the residues.
Sodium carbonate (soda ash)	Biological or mined sources. *See* Table 7.4 Sodium carbonate (soda ash), synthetic.	Can be extracted from the ash of many plants growing in sodium-rich soils (e.g., plants from the Middle East, kelp from Scotland; seaweed from Spain). Because the ash of sodium-rich plants differs from ash from timber (used to create potash), it is known as “soda ash.” Can cut through grease, especially on non-porous surfaces such as stainless steel, and coated surfaces.
Sodium citrate		Used as a buffering agent in the formulation of cleaning products and as a water softener.
Sodium hydroxide (lye or caustic soda)		Made through the electrolysis of an aqueous solution of sodium chloride. Used as an industrial cleaning agent where it is often called “caustic.” It is added to water, heated, and used to clean process equipment,

Substance name(s)	Origin and usage	Guidance
		storage tanks, etc. It can dissolve grease, oils, fats and protein-based deposits. Surfactants can be added to the sodium hydroxide solution to stabilize dissolved substances and thus prevent redeposition. A sodium hydroxide soak solution is a powerful degreaser for stainless steel and glass bakeware. Sodium hydroxide can be used in water purification to raise the pH of water supplies. A higher pH makes the water less corrosive to plumbing and reduces the amount of lead, copper and other toxic metals that can dissolve into drinking water. When sodium hydroxide is mixed with a surfactant, it is categorized as a detergent under this standard and a mandatory removal event is required. *See* Detergent listing in 7.4.
Surfactants, biodegradable	Surfactants either stand-alone or when formulated with substances listed on Table 7.3 shall be readily, ultimately or inherently biodegradable as per the Organisation for Economic Co-operation and Development (OECD) definitions. Permitted for egg washing.	
Vinegar		Used as an anti-microbial agent and can be used to rinse or clean organic produce.

Table 7.4 - Cleaners, Disinfectants and Sanitizers Permitted on Organic Product Contact Surfaces for which a Removal Event is Mandatory

Substance name(s)	Origin and usage	Guidance
Chlorine compounds	The following chlorine compounds are permitted up to maximum label rates: a) calcium hypochlorite; b) chlorine dioxide; c) hypochlorous acid generated via electrolyzed water; and/or d) sodium hypochlorite.	Used to kill bacteria and disinfect. For example, it is used to: • Treat pasteurizer cooling water; • Wash fruit, vegetables and poultry carcasses; and • Disinfect product contact surfaces. Chlorine mixed with calcium is usually in granular or tablet form (calcium hypochlorite) and when mixed with sodium is a liquid bleach (sodium hypochlorite). Hypochlorous acid (HCIO) in water releases hypochlorite (CIO-). Chlorine may be available as chlorine dioxide although hypochlorites are the most active of the chlorine compounds. Electrolyzed water (which may contain hypochlorous acid as a byproduct of either electrolysis or from the dissolution of chlorine compounds in water) is permitted.
Detergents	Detergent products shall be: 1) readily, ultimately or inherently biodegradable as per the Organisation for Economic Co-operation and Development (OECD) definitions; or	Detergents are complex products containing up to 20 or more ingredients. The standard does not require each component to be assessed for compliance. All that is needed is confirmation of the biodegradability status of the product (not of each ingredient), or confirmation that the detergent breakdown products have been neutralized during wastewater treatment.

Substance name(s)	Origin and usage	Guidance
	2) composed of substances listed in Tables 7.3 or 7.4 (if surfactants are added, the surfactants will meet the OECD definition of biodegradable); or 3) readily eliminated during wastewater treatment such that harm to the environment is minimized	Biodegradability information can be found in the "Ecological Information" contained in Section 12 of a product's Safety Data Sheet under the subheading "Persistence and degradability." A typical phrase that demonstrates compliance is "Product is expected to be readily biodegradable as per OECD 301." The 301 series of OECD tests includes six testing methods used to confirm ready biodegradability in an aerobic aqueous medium. OECD definitions relevant to this substance listing: • Inherent biodegradable: A classification of chemicals for which there is unequivocal evidence of biodegradation (primary or ultimate) in any test of biodegradability. • Ultimate aerobic biodegradation (mineralization): The level of degradation achieved when the test compound is totally utilized by micro-organisms resulting in the production of carbon dioxide, water, mineral salts and new microbial cellular constituents (biomass). • Readily biodegradable: An arbitrary classification of chemicals which have passed certain specified screening tests for ultimate biodegradability; these tests are so stringent that it is assumed that such compounds will rapidly and completely biodegrade in aquatic environments under aerobic conditions. However, if a detergent product is composed solely of compliant surfactants and substances listed in Table 7.3 or 7.4, there is no need to assess OECD compliance.
Essential oils	Derived from plant sources using substances in Table 6.3 Extraction solvents and precipitation aids. May contain permitted carriers (*see* Table 6.3 and 6.4 Carriers).	Orange oil is an example of an essential oil that is used for cleaning. Some commercial orange oil products do not meet the origin requirement as they are made from petrochemicals. Aromatics are

Substance name(s)	Origin and usage	Guidance
		added giving these petrochemical based versions the right fragrance in but these products would not be compliant to the standard.
Iodine	Shall be non-elemental. Shall not exceed 5% solution by volume (example: iodophors).	Iodophors (a mixture of iodine and surfactant) have broad spectrum activity and are effective against a wide range of bacteria, viruses, yeasts, moulds, fungi and protozoans. Although less affected by organic matter and water hardness than chlorine, iodophors have a limited effective temperature range (24C-34C). They are least effective at low temperatures and vaporize at 49C. They are most effective at low pH (2.5-3.5). Iodophors have 2.5 times the oxidizing power of chlorine, so a lower concentration is required (e.g., 25 ppm). Iodophors can stain and discolour equipment, especially plastics. Commonly used for sanitation in the meat industry.
Lime	All forms of lime, including calcium carbonate, calcium hydroxide and calcium oxide.	Also known as calcium oxide, burnt lime, or quicklime. All sources are allowed for cleaning purposes as long as there is a mandatory removal event.
Methanesulphonic acid (MSA)		Having MSA in Table 7.4 reduces the need for operators to evoke 8.2.3 when a stronger acid is needed than those currently listed in Table 7.4. MSA is a mineral acid, like nitric or sulphuric acid, but not as strong. It is common in the environment and part of the biogeochemical sulphur cycle. MSA is added to cleaning formulations including a variety of biodegradable detergents to help dissolve minerals.
Octanoic acid (caprylic acid)		Works as a surfactant, an antimicrobial agent and an emulsifier. When added into hydrogen peroxide products or peracetic products, octanoic acid increases the effectiveness of the product without

Substance name(s)	Origin and usage	Guidance
		increasing the product's toxicity to humans or the environment.
Peroxyoctanoic acid (POOA)		Works as a surfactant, an antimicrobial agent and an emulsifier. When added into hydrogen peroxide products or peracetic products, peroxyoctanoic acid increases the biocide potency of that product without increasing the product's toxicity.
Phosphoric acid	On dairy equipment.	Acid sanitizer commonly used in the dairy industry.
Potassium carbonate	Documentation shall demonstrate that effluent discharge was neutralized to minimize negative environmental impact.	Prepared commercially by the electrolysis of potassium chloride. As potassium carbonate increases the pH of water if not chemically neutralized before discharged it could impact aquatic species.
Potassium hydroxide (caustic potash)		
Potassium permanganate	Not to exceed 1% solution by volume.	This salt is also known as "permanganate of potash."
Saponin	Derived from plants such as *Yucca schidigera* and *Quillaja saponaria*.	Plant compounds which are surfactants and produce foam when dissolved in water. The word "saponin" comes from the same root as "soap" (Latin *sapo*=soap). Like soaps, saponins are large molecules containing a water-loving (hydrophilic) end and a fat-loving (hydrophobic) end. This unique structure and the way saponin molecules align on surfaces lead to saponin's ability to reduce the surface tension of the water, and create foam.

Substance name(s)	Origin and usage	Guidance
Soap-based algicide (demossers)		An algaecide or algicide is a substance used for killing and preventing the growth of algae. Numerous organic standards are the only documents in the world to refer to this substance as a "demosser." More properly the substance refers to "moss killer," which (obviously) is used to kill moss. Any soap-based products are allowed provided they are not fortified with prohibited pesticides in the carrier (the carrier can make up 80% of the product). Operators should check with their supplier to determine if a product is compliant (i.e., permitted).
Soaps	Soaps shall consist of fatty acids derived from animal or vegetable oils.	Soap is composed of sodium (soda ash) or potassium (potash) salts of fatty acids derived by reacting fat (animal or vegetable) with lye in a process known as saponification. The fats are hydrolyzed by the base, yielding glycerol and crude soap. Many cleaning agents today are technically not soaps, but are detergents, which are less expensive and easier to manufacture.
Sodium borate		Also known as borax, sodium tetraborate, or disodium tetraborate.
Sodium carbonate (soda ash), synthetic		It is produced in large quantities from salt (sodium chloride) and limestone by the Solvay process. Used as a component of cleaning products due to its disinfectant properties, ability to cut through grease and ability to soften water. Can be found in dishwashing detergents, all-purpose cleaners, sanitizing sprays and bleach. Also used as a neutralizing agent for the absorption of anionic surfactants.
Sodium percarbonate		Sodium percarbonate works in solution as if sodium carbonate and hydrogen peroxide are added separately. It is beneficial because percarbonate releases oxygen at a lower temperature, and is effective as a laundry bleach.

Substance name(s)	Origin and usage	Guidance
Sodium silicate	In detergents.	Used in dishwashing powders for their wetting and emulsifying properties. All silicates have excellent buffering action against acidic compounds. Silicates can inhibit the corrosion of stainless steel and aluminum by synthetic detergents and complex phosphates.
Surfactants	Surfactants either stand alone or when formulated with substances listed in Tables 7.3 or 7.4 to create cleaning products including detergents, soaps, degreasers, and disinfectants, shall be readily, ultimately or inherently biodegradable as per the Organisation for Economic Co-operation and Development (OECD) definitions, or readily eliminated during wastewater treatment such that harm to the environment is minimized.	Surfactants or “SURFace ACTive Agents” are compounds that lower the surface tension between two liquids. They can act as detergents, wetting agents, emulsifiers, foaming agents or dispersants. There are negatively charged (anionic), no charge (nonionic), and positively charged (cationic) surfactants. Block copolymer surfactants and alkyl polyglucoside surfactants are nonionic. Most often surfactants are ingredients contained in purchased products, especially detergents. If a soap product contains a surfactant, the product is considered a detergent (*See* Detergents). Similar to detergents, if surfactants are used on their own, confirmation is needed that the surfactant is biodegradable or that the surfactant is neutralized during wastewater treatment. When contained in a compound product, such as a detergent, documentation for the detergent should be used to confirm the biodegradability of the entire product including the surfactant. Biodegradability information can be found in the “Ecological Information” contained in Section 12 of a product’s Safety Data Sheet under the subheading “Persistence and degradability.” A typical phrase that demonstrates compliance is “Product is expected to be readily biodegradable as per OECD 301.” The 301 series of OECD tests includes six testing methods used to confirm ready biodegradability in an aerobic aqueous medium.

Substance name(s)	Origin and usage	Guidance
Surfactants, biodegradable	Surfactants, used alone or added to substances authorized in Table 7.3, must be ultimately or intrinsically biodegradable according to the definitions of the Organisation for Economic Co-operation and Development (OECD). Egg washing permit.	
Wetting agents	Substances listed in Table 4.2 or 7.3, including saponins and microbial wetting agents.	Wetting agents include not only surfactants that lower the surface tension between two liquids, but also compounds that lower the surface tension between liquids and solids. All surfactants are wetting agents; but not all wetting agents are surfactants.

8. Facility Management Substances

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8. Facility Management Substances

		Guidance
8.1	**Classification**	
8.1.1	Facility management substances are classified according to the following uses and applications:	
8.1.1 a	Substances listed in Table 8.2 are pesticides (*See* definition of Pesticides in clause 3 of CAN/CGSB-32.310) that may be used in and around facilities, as annotated and as specified in subclause 8.3.2 of CAN/CGSB-32.310. These substances may also be used in traps, lures and as repellents, unless indicated otherwise within substance annotations.	
8.1.1 b	Substances listed in Table 8.3 may be used in facilities as annotated, to accomplish a physiological effect post-harvest.	
8.1.1 c	Substances listed in Tables 8.2 and 8.3 are not subject to Clauses 1.4 and 1.5 of CAN/CGSB-32.310.	The addition of this exception for facility pest management substances is necessary as it states in the last sentence of 1.1 Scope of 32.311 "Listed substances comply with prohibitions in 1.4 and 1.5 of CAN/CGSB-32.310," which was never the intention with the context of pest control substances.

Table 8.2 - Facility Pest Management Substances

Substance name(s)	Origin and usage	Guidance
Ammonium carbonate	As an attractant in insect traps.	Also known as smelling salts and can be used as a lure in insect traps.
Baits for rodent control	Non-poisonous baits are allowed for use with rodent control devices in locations where there is no potential for contamination of organic products, crops, or fields with prohibited substances.	A bait station or bait box is a rodent trap containing bait, often a substance that will kill the rodent. Bait stations are not often used in the interior of a food handling or storage facility because this does not comply with most food-safety protocols. However, bait stations are commonly used outside of these buildings to prevent rodent intrusions into facilities. All forms of baits may be used in exterior bait stations at processing facilities located in industrial districts. Also, all forms of bait may be used in the exteriors of facilities located on organic crop or livestock operations as long as there is no risk of contamination of organic land, crops or livestock. In these circumstances, it is best to use bait stations that double as traps and are inescapable. On-farm facilities include grain bins, hay lofts, poultry barns, cold and dry storage, etc. Bait stations could become necessary on the interior of a facility but only under extreme circumstances (*see* 8.3 of 32.310). It makes sense to use inescapable traps to minimize the risk to organic products and contact surfaces.
Boric acid	May be used for structural pest control (example: for ants). Direct contact with organic products is prohibited.	Boric acid is produced mainly from borate minerals by the reaction with sulphuric acid. Used as an insecticide for control of cockroaches, termites, fire ants,

Substance name(s)	Origin and usage	Guidance
		fleas, silverfish and many other insects. It acts as a stomach poison affecting insect metabolism, and the dry powder is abrasive to insect exoskeletons.
Carbon dioxide (CO_2)	For controlled atmosphere storage and for storage pest control.	An effective fumigant used to kill pests in sealed containers storing vegetables, grain, fruit, or feed; it is not harmful to humans or livestock that later consume them. The concentration of CO2 required and the length of time the product must be exposed in a sealed container will depend upon various factors including the type of product and pest."
Cholecalciferol (vitamin D_3)	Prohibited inside organic food processing and food storage facilities.	Cholecalciferol is a form of vitamin D, also called vitamin D3, that can be used as a rodenticide. When rodents eat it, calcium and phosphate concentrate in their bodies and this causes their blood to coagulate. It is prohibited to use this within food and food storage facilities. This may seem in opposition to the broad allowance in the Bait stations listing in this table. But once vitamin D3 is consumed, rodents seek water; therefore its use can lead to contamination.
Diatomaceous earth	Direct contact with organic products is permitted.	Diatomaceous earth (DE) is a powder made from fossilized hard-shelled algae called diatoms. When in contact with an insect that has an exoskeleton (such as an ant), the sharp edges of DE cut into the insect's body causing it to die of dehydration. Diatomaceous earth is most useful in dry situations, for example, puffing it into crevices where cockroaches have been seen. If treating a crop in storage such as grain in a bin, be sure the DE product is registered by PMRA for that use.
Formulants	May only be used with substances listed in Table 8.3.	Most pesticides contain formulants of some type. Review each

Substance name(s)	Origin and usage	Guidance
	Only formulants classified as List 4A or 4B by the Pest Management Regulatory Agency (PMRA) or derived from biological or mineral sources may be used with substances in Table 8.2. Formulants classified as List 3 by PMRA may be used with passive pheromone dispensers. Formulants classified as List 4A, 4B or 3 by PMRA are not subject to Clauses 1.4 or 1.5 of CAN/CGSB-32.310. Formulants classified as List 1 or 2 by PMRA are prohibited.	formulant against the following list to determine if the pesticide product is permitted for use in a facility or in contact with harvested product in the facility: • Non-synthetic formulants are permitted in pesticide products; • PMRA List 1- or List 2-listed formulants are prohibited, therefore pesticide products that contain them are prohibited; • PMRA List 3-listed formulants are permitted ONLY in passive pheromone dispensers; • PMRA List 4A- and 4B-listed formulants are permitted in pesticide products. Any formulants in a product which is permitted as noted above are not subject to the prohibitions listed in 1.4 and 1.5 of CAN/CGSB-32.310.
Neem oil		Neem oil and the active ingredient Azadirachtin are extracted from the fruit and nuts of the neem tree. They are non-selective pesticides and as of 2026, no neem products are registered for agricultural pest control in Canada by the PMRA. Neem oil is listed in the PSL in order to facilitate acceptance of foreign products from origins where it is permitted for pest control.
Pheromones and other semiochemicals	For pest control. Use in pheromone traps or passive dispensers.	A pheromone trap uses pheromones to lure insects. Sex pheromones and aggregating pheromones are the most common types of pheromones used. Usually a pheromone-impregnated lure is encased in a conventional trap such as a Delta trap, waterpan trap or funnel trap. Killing agents are sometimes present in the traps. Pheromones are triggers between individuals of the same species, Semiochemicals are the broader category which refers to substances released from one organism that affect another organism, of either

Substance name(s)	Origin and usage	Guidance
		the same or an unrelated species.
Pyrethrins	Without piperonyl butoxide. Direct contact with organic products is prohibited	A class of organic compounds normally derived from *Chrysanthemum cinerariifolium*, which have potent insecticidal activity by targeting the nervous systems of insects. This plant extract is pyrethrum, which contains the active ingredient pyrethrin. Pyrethrin can be made synthetically by industrial methods; these are known as pyrethroids and are not permitted under the standard.
Repellents	Shall be derived from a biological source, such as sterilized blood meal, rotten eggs, hair or predator scents. May contain other biological compounds and PMRA 4a- or 4b-listed formulants.	As a deterrent for large animals such as deer, rabbits, voles, elk chipmunks, etc.
Soaps, ammonium	As a large animal repellent. Direct contact with organic products is prohibited.	A product from the reaction of a fatty acid with ammonium hydroxide.

Table 8.3 - Post-harvest Substances

Substance name(s)	Origin and usage	Guidance
Carbon dioxide (CO_2)	For controlled atmosphere storage.	Used in combination with other gases such as oxygen and nitrogen to modify the gaseous composition of the atmosphere in which food or feed products are stored.
Botanical oils	Oils from the Lamiaceae (mint family), Apiaceae/Umbelliferae (celery family) and Myrtaceae (clove family) may be used as post-harvest sprout inhibitors.	Clove oil is distilled directly from the evergreen plant *Syzygium aromaticum*. The plant is native to Indonesia but is now grown in several other countries including Madagascar and Brazil. The active ingredient of clove oil is eugenol and other eugenol-based components in the distillate product. Due to the chemistry and volatility of clove oil, it can be applied with a thermal applicator and distributed throughout the storage facility. When clove oil was added to the table, the only information available on using botanical oils as sprout inhibitors focused on the efficacy of clove oil as a natural sprout inhibitor on potatoes. Up to that time, most sprout inhibitors were chemical products like chlorpropham (CIPC) - products completely unacceptable to organic standards. Other botanical oils can also be effective sprout inhibitors. Furthermore, there is no reason to restrict the use exclusively to potatoes. Other organic crops, such as onions, shallots, garlic and yams, may benefit from this improved listing.
Ethylene	For post-harvest ripening of tropical fruit and degreening of citrus and to control sprouting of potatoes post-harvest in holding bins.	Produced by heating either natural gas, especially its ethane and propane components, or petroleum to 800-900C (1,470-1,650F). Ethylene is then separated from the resulting mixture by repeated compression and distillation. Used to control the conditions of fruit or

Substance name(s)	Origin and usage	Guidance
		vegetables in storage (such as bananas) in order to manage the timing of when it will be ready for retail sale.
Formulants	Formulants may only be used with substances listed in Table 8.3. Only formulants classified as List 4A or 4B by the Pest Management Regulatory Agency (PMRA) or are non-synthetic may be used with substances in Table 8.3. Formulants classified as List 3 by PMRA may be used with passive pheromone dispensers. Formulants classified as List 4A, 4B or 3 by PMRA are not subject to Clauses 1.4 or 1.5 of CAN/CGSB-32.310. Formulants classified as List 1 or 2 by PMRA are prohibited.	*See* entry in Table 8.1.
Nitrogen	For controlled atmosphere storage.	Used in combination with other gases, such as carbon dioxide and oxygen, to modify the gaseous composition of the atmosphere in which food or feed products are stored.
Oxygen		Oxygen is separated from atmospheric air. Used in combination with other gases in controlled atmosphere storage.