

FARM PRACTICE

PRODUCT PROCESSING

Description

Processing is defined as any activity that maintains or raises the quality or alters the physical or chemical characteristics of a material or object, or adds value to it in any way whatsoever. Processing can be as simple and quick as washing vegetables or it can be as involved and complicated as making cheese or wine. Cooking, canning, smoking and drying are among the various methods used in the processing industry.

Many farm products must be processed before they can be used by the general public or by farmers. For example, most fruits and vegetables are cleaned, graded and stored or processed before they enter the retail market. Similarly, many rations are cleaned, dried, ground and mixed before they are fed to livestock.

Many agricultural products are perishable and are only suitable for consumption over a short period of time. Processing extends the season during which they are available. For example, the conversion of berries and fruit into jam, jelly and juice means consumers can enjoy these products year-round.

On-farm processing is done to prepare products for sale, to make value-added products to sell, and to prepare feed for livestock. On-farm processing also includes the preparation of growing media for greenhouse and mushroom production and for composting of farm wastes. Processing operations may be carried out continuously or intermittently.

Wastes generated during processing operations are not considered to be agricultural wastes but industrial wastes, and their discharge must therefore be governed and regulated under the *Environmental Management Act*.

Activities and Operations

Equipment Operation

On-farm processing equipment may be operated 24 hours a day. All on-farm processing equipment, machinery or other devices should be kept in good working condition and operated according to manufacturers' recommendations.

See also Farm Practices: [Stationary Equipment](#)
[Mobile Equipment](#)
[Composting](#)

On-Farm Processing and Product Preparation

On-farm processing and product preparation should be permitted for situations in which the property on which the processing and preparation occurs includes a commodity or commodities produced on the associated farm unit. In addition, requirements of the Agricultural Land Commission (ALC) and the Ministry of Environment must be met. In certain situations, waste management permits and approvals from the provincial Ministry of Health and the Ministry of Agriculture, and the federal Agriculture and Agri-Food Canada may be necessary. Farmers may import products onto their farm for processing provided that at least 50% of the product that is processed originates from the farm. On-farm processing and preparation of products not grown on the farm may require application under the Agricultural Land Commission Act.

Materials Handling

Materials handling operations often include the following activities:

Cleaning. Cleaning of agricultural products can be accomplished by soaking or water spraying or by using rotary drums, brush washers, shaker washers, or any combination thereof.

Washing. The *Fresh Fruit and Vegetable Regulations* under the *Canada Agricultural Products Act* requires that products be prepared in a sanitary manner. They stipulate that flumes and wash water used for processing are not stagnant or polluted, that only potable water is used in the final rinsing of produce to remove any surface contamination before packing, that the final rinse water if reused is used only in the initial washing or fluming of the produce, and that the produce is handled with equipment that is cleaned regularly.

Sorting. Fruits and vegetables are sorted by colour, size and quality using screens, diverging belts, roller sorters and weight sorters. Grains, nuts and seeds are cleaned and sorted by size, shape, specific gravity and surface characteristics using screens, blowers, specific gravity separators, centrifuges, cyclones and other similar equipment.

Separating. The most common types of equipment used for separating a variety of agricultural products include cream separators, gravity separators and cyclones.

Grading. Farm products may be graded by colour, quality, shape and size.

Packaging. Farm products may be packaged individually, in groupings, or in bulk.

Conveying and transporting. Conveyors, elevators, augers, lift trucks and other types of equipment are used to move materials and goods.

Size Reduction

A variety of size reduction operations are used to process agricultural products.

Cutting. Fruit and vegetables are cut in preparation for processing operations such as freezing or canning.

Chopping or shearing. Forages such as corn and silage are typically chopped to optimize the ensiling process.

Shredding. Some products are shredded to assist in mixing and drying operations.

Crushing. Some agricultural products are crushed for juice or oil extraction and to expedite drying.

Grinding. Grinding and hammering of grains is a common practice in the preparation of livestock feed.

Milling. Milling operations are used to produce flour or to separate fibres in crops such as flax.

Mixing

The following agricultural materials and products are mixed in processing operations.

Livestock feed is mixed in batches or continuously with augers or paddles.

Fruits and vegetables are typically mixed in kettles or drums with paddles. Equipment using variations of egg beaters is used for a variety of purposes as well.

Fertilizers and soils are mixed in batches or in continuous operations using augers, drums or paddles.

Composting materials are mixed using front-end loaders, side-mounted or self-propelled windrow turners, and in-vessel compost turners.

Drying

The following agricultural materials and products are often dried as part of broader processing operations:

Grain is dried using batch, bin and continuous gravity flow dryers.

Hay can be dried using natural air for convection for smaller quantities or heated air if drying must be completed before spoilage occurs.

Fruits, vegetables and associated wastes may be dried using vacuum ovens, rotary dryers, tray or tunnel dryers, and freeze dryers.

Powders typically have excess moisture removed with spray dryers.

Heat Treatment

Heat is used to pasteurize milk and juice, to boil fruits and vegetables for vacuum or freeze packaging, to steam or thermally sterilize canning equipment, and to fry or bake products for retail use. Conduction, convection and radiation methods are widely used in processing industries.

Cold Treatment

Many products are cooled to prolong shelf life. Various types of mechanical refrigeration equipment and structures include dairy coolers, cold storages, freezers and controlled atmosphere storages.

Chemical Treatment

Seed may be treated with fungicides and insecticides to improve resistance to decay during storage or during early growth. Various chemical treatment products may be added to processed fruit, vegetable, meat and dairy products to improve shelf life and appeal.

Biological Treatment

Biological treatments to enhance product shelf life or appeal may include aeration or oxygenation. Fermentation may be used to produce specific products prior to marketing.

Retail Activities

The Agricultural Land Commission's farm retail sales order specifies which retail activities may be carried out on a farm within the Agriculture Land Reserve. Restrictions on sales of products grown off the farm – including the size of the retail area that can be used for off-farm products – are also specified.

Related Farm Practices

Other farm practices that pertain to product processing practices include, but are not limited to, the following:

Farmstead Refuse

Refuse should be managed to keep farm premises neat and tidy and should be disposed of in compliance with associated waste management legislation.

See also Farm Practice: [Farmstead Refuse](#)

Storage of Farm Supplies and Products

Storage of containers and products is often required at product processing sites.

See also Farm Practice: [Storage of Farm Supplies and Products](#)

Transportation

Most processing operations require the transportation of inputs and finished products to and from facilities.

See also Farm Practice: [Transportation](#)

Principal and Accessory Buildings

Farm operations that incorporate product processing activities typically feature a variety of structures. From a watercourse protection perspective, it is essential to determine which structures fall under the definition of principal buildings and which are accessory buildings. For the purposes of determining applicable setbacks from watercourses and property lines, therefore, local government bylaws or the *Guide for Bylaw Development in Farming Areas* should be consulted. Building assessments may need to be conducted on a case-by-case basis. It may be helpful to refer to the specific commodity or farm practice document for which a product processing operation is applicable to determine the scope and definition of principal and accessory farm buildings that may exist on the farm site.

Legislation

Information on federal and provincial legislation can be found in Appendices B and C. Acts, regulations and bylaws that regulate farm product processing may include, but are not limited to, the following.

Federal Legislation

The *Canada Agricultural Products Act* outlines requirements for national standards and grades of agricultural products. The *Processed Products Regulations* under this Act specify requirements for processing.

The *Consumer Packaging and Labelling Act* establishes basic labeling requirements for a broad range of prepackaged consumer products.

The *Food and Drugs Act* governs the sales and marketing of food.

The *Health of Animals Act* addresses diseases that may affect animals or be transmitted to humans. The Act also enables regulatory control of Specified Risk Material (SRM) to prevent its entry into the animal feed system. The enhanced feed ban regulations under this Act stipulate that producers not feed any animal products containing SRM to livestock and that abattoirs properly identify SRM to ensure that it is removed from the feed system.

Provincial Legislation

The *Agricultural Land Commission Act* regulates the degree of processing that may occur on farms.

The *Agricultural Produce Grading Act* provides a framework for standards associated with quality control of produce.

The *Food Products Standards Act* establishes compositional and quality standards for processed foods.

The *Environmental Management Act* protects the soil, water and air environment from pollution.

The *Food Safety Act* and its *Meat Inspection Regulations* regulate animal slaughter for food and the sale of meat for food in British Columbia.

The *Natural Products Marketing (BC) Act* controls the production, transportation, packing, storage and marketing of natural products in the province.

Local Government Legislation

Where applicable, local zoning bylaws may govern operations that incorporate varying degrees of product processing.

Publications

Publications that provide information on farm product processing include, but are not limited to the following. Refer to Appendix D for details.

British Columbia Food Processor's Reference Manual

British Columbia Good Agricultural Practices (GAP) Guide

British Columbia Environmental Farm Plan Reference Guide

Direct Marketing: A Handbook for Producers

Microbial Food Safety Checklist – Field Production of Vegetables and Berries

Microbial Food Safety Checklist – On-Farm Packing of Field Vegetables and Berries

On-Farm Food Safety

On-Farm Processing: A Handbook for Producers