

Identifying Your Food Processing Equipment Needs



There is a wide range of food processing equipment required for the various operations of a complete production cycle to prepare, handle, cook, package or store products.

Depending on the product and operational demands, food processing equipment can be designed and constructed to handle solid, semi-solid and liquid products, in a batch or continuously.

The optimal design and construction of the food processing equipment depends on the specifications and requirements of the particular food processing application. Each stage of the production will help you identify what is required for your product.

A) Preparation Stage

Cleaning, grading, sorting, peeling or skinning are some of the necessary processes for the preparation of raw material.

- 1. Cleaning:** The cleaning process, divided into wet and dry processes, is done to remove contaminants and foreign matter from the surface of raw food material. The food processing equipment used during this process can include both wet and dry processes.
- 2. Grading:** Grading is closely related to sorting and can determine the overall quality by assessing several food characteristics.
- 3. Peeling/Skinning:** To increase the overall quality or appearance of the final food product, inedible or undesirable material is removed by this food process.
- 4. Sorting:** The operation is quite similar to a dry cleaning process. Based on a measurable physical characteristic, sorting classifies and separates contaminants and foreign matter from raw food material.

B) Mechanical Processing

Now that you have an overview of the functions of equipment in the preparation stage, the next stages of production are the mechanical processing operations. Mechanical processing includes grinding/crushing, cutting and forming.

- 1. Size Reduction:** Size reduction is the first unit operation done in mechanical processing to reduce the average particle size of solid food matter. This is achieved through mechanical processes involving shear impact or compression force.
- 2. Size Enlargement:** Mechanical processes such as agglomeration, forming or extrusion increase the average particle size of solid food matter.
- 3. Homogenization/Emulsification:** The average particle size is reduced and the consistency of semi-solid and liquid food matter is increased.

4. Mixing/Blending: To achieve and maintain a uniform mixture, mixing combines two or more components into one. The type of equipment needed depends on the food component's form.

C) Cooking Methods

In food production operations, selecting an appropriate cooking method is not only critical for food safety but also has a direct impact on the taste, texture, appearance and flavour of the resulting food product.

1. Blanching: Blanching is a process to stop enzyme actions that would otherwise cause a loss of flavour, color and texture. Fruits or vegetables are scalded in boiling water or steam for a short time and are then quickly, thoroughly cooled in very cold or ice water.

2. Baking: Baking is a type of dry heat cooking, similar to roasting, which is done in an enclosed space such as an oven (not over a direct flame). Most people think of roasting as something that is done to meats and vegetables, while baking usually refers to desserts or dishes using flour. Some people use the terms interchangeably.

3. Frying: Sautéing, stir-frying, pan-frying, shallow-frying and deep-frying are all standard frying techniques. Deep-frying is considered a dry heat method of cooking, as it uses heat conduction and natural convection to transfer heat to food submerged in fat.

4. Drying: Dehydration is a way that many types of food can be preserved for indefinite periods by extracting the moisture, which inhibits the growth of micro-organisms. Freeze-drying keeps cell structure intact more effectively than the air-drying process. Finished air-dried products tend to have a more shriveled appearance. Due to higher moisture content, however, an air-dried product can have a higher colour saturation than its freeze-dried counterpart.

5. Smoking: Hot-smoking is the process where meat is slowly cooked and smoked at the same time. In a smoker, the air temperature is increased and carefully controlled to raise the meat temperature to produce a fully cooked food product.

D) Packaging

Packaging is an essential component of food production. In addition to containing, protecting and preserving food from field to the end user, food packaging plays many other roles, including:

- reducing food waste
- providing marketing and traceability information
- offering convenience and tamper indicators

These important components are addressed through the processes of filling, sealing and labelling at each step. For more details on packaging options, see our [Food Packaging resource \(www.manitoba.ca/agriculture/food-and-ag-processing/starting-a-food-business/pubs/food-packaging.pdf\)](http://www.manitoba.ca/agriculture/food-and-ag-processing/starting-a-food-business/pubs/food-packaging.pdf) and talk to a [business development specialist](#) for a listing of packaging and labelling suppliers. (See the email address in the contact listing at the end of this document.)

When sourcing food processing equipment, there are a variety of considerations food processors should take into account — and it's not just about finding the right technology to do the job. It is important to source equipment that is easy to clean and maintain, as hygiene and quality output should be a priority for all food processors to prevent cross-contamination of ingredients.

Important questions to consider when choosing equipment:

- Has the equipment been designed for straightforward cleaning?
- Does the equipment allow for simple, quick changeover of materials?
- Does the equipment take safety regulations into account and protect operators from potentially dangerous moving components?
- Can your equipment supplier offer quality replacement parts and servicing quickly?
- Will the equipment's design allow for a comfortable, safe working environment that minimizes noise and dust emissions?
- Is the equipment easy to operate and configure for different materials to allow for higher levels of productivity?
- Can the equipment be integrated into other systems, allowing for maximum flexibility in your production line?

With hygiene, efficiency and maintenance top of mind, the next step is sourcing the equipment to fill your production line needs. Contact a [business development specialist](#) (see email below) for assistance with making connections in the food processing equipment industry.

Sources: www.plantautomation-technology.com; www.kemutec.com

For more information

Go to manitoba.ca/agriculture/food-and-ag-processing/

Email mbagrifood@gov.mb.ca

Follow us on Twitter @MBGovAg

And [Manitoba Agriculture YouTube](#)

Available in alternate formats upon request