



HOW TO CONDUCT A BASIC SHELF-LIFE STUDY

Ever wonder how long a product will stay fresh and have the best quality? Are retailers, regulators, auditors, or even customers challenging the best before date currently on a package? If time and space allow, a business can perform the majority of basic shelf-life studies in-house as they will be the most familiar with the product.

WHAT IS A SHELF-LIFE STUDY, AND WHY IS IT NEEDED?

A shelf-life study is a way to determine the durable life of a product, better known as the best before date. A shelf-life study will supply the documented evidence required to show retailers and regulators that the food will stay fresh, taste good, and retain its nutritional value and quality until the end of the best before date on the **unopened package if stored under the appropriate conditions.**

The last part of that statement is key since the shelf-life of any food can be affected by external factors such as temperature abuse and proper seal. These factors can be controlled until it leaves the facility. However, once the product leaves, these factors are outside the organization's control. The intrinsic factors refer to the inherent properties of the product, such as formula, water activity, pH, packaging interactions, and preservatives.

A shelf-life study can help determine how long the product, under normal handling and storage, can maintain its taste, quality, microbial, chemical, and physical properties, remain wholesome, and meet the nutritional claims and declarations that are printed on the label.

WHAT TO CONSIDER WHEN CONDUCTING A SHELF-LIFE STUDY

ESTIMATE THE SHELF-LIFE FOR THE PRODUCT

- The approximate shelf-life may be based on industry guidelines and information from scientific publications. You may also have an estimate based on your own observations. This will provide a starting point for the product.

DECIDE WHAT TESTS TO COMPLETE

- Sensory tests can be completed in-house or can be contracted out. Factors such as taste, texture, smell, and colour/appearance are properties that should be well known when it comes to a product. It's best to have at least three people to complete sensory tests. The product should be tested under normal eating conditions, and it should be safe to eat. Panellists should avoid eating (especially spicy foods, coffee, tea), smoking or brushing teeth within an hour before the panel.
- If possible, or relevant complete microbial (bacteria, yeast and mould) and chemical tests (pH, water activity, gas analysis, free fatty acids) on the product. If this is not possible, or there is not enough time, consider sending a sample to one of several local food labs.

INTERVALS

- Determine what intervals should be tested until the end of the shelf-life study. For example, if the shelf-life is six months, consider testing the product when it's first made then monthly after that. Another option is to test it monthly until the last month or so and then weekly after that until the shelf-life is exceeded.

SAMPLES

- Make sure to set aside enough unopened samples of the same lot of product, so there is enough to conduct the full study. There is nothing worse than running out of samples halfway through or at the end of the study.

STORAGE/TEST CONDITIONS

- Make sure to conduct the shelf-life study based on the samples being stored at the proper conditions. Any variance will skew the results, such as storing samples in a well lit area when the product is light sensitive. Record temperatures and humidity regularly to ensure the sample is meeting optimum storage requirements.

EVALUATE THE DATA

- Don't forget that the study isn't complete until the data is reviewed, and it's determined if it meets the shelf-life assigned to the product.

REPEAT THE PROCESS

- Once a shelf-life study is complete, it does not mean the process is finished. Repeat this process periodically to ensure the product will continue to meet the assigned shelf-life. This is required if the process, packaging, and/or formula/recipe changes as this will affect the shelf-life.

WHEN TO ASK FOR HELP

Depending on the type of product produced, the facility may have time to conduct a shelf-life study, or they may want to contract it out. There are many local labs available that can conduct shelf-life studies, including Perennia.

WHICH PRODUCTS REQUIRE A BEST BEFORE DATE?

The Canadian Food Inspection Agency (CFIA) states, any prepackaged food with a shelf-life/durable date of 90 days or less and packaged at any location other than a retail store where it is intended to be sold must be labelled with a

durable life date or best before date. The CFIA also requires the product to include storage instructions if those storage requirements are different than normal room temperatures. For products with a longer shelf life, even though it is not required by CFIA, a best before date may be requested by your customers or expected by consumers.

HOW TO EXTEND A PRODUCT'S SHELF LIFE

- Having a good food safety program in place will ensure a facility is following good manufacturing or agricultural practices, thus producing a product that meets expected quality criteria and has a consistent shelf life.
- Use the freshest and best quality ingredients possible and store them properly to ensure the best products are made. The quality of ingredients used affects the quality of the product produced.
- The type of packaging selected can affect how the product fares on the shelf. Consider packaging properties such as gas permeability, whether the packaging protects against environmental factors (light, odours, and microorganisms), strength and durability, and compatibility and reactivity with food.
- Give customers storage directions and, educate them on how they should use and store the product after they purchase.
- If an organization is having trouble meeting the shelf-life, it might be time to call a professional. There may be some adjustments to your product, package or process that can be considered.

FOR MORE INFORMATION

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RESOURCES

<http://www.inspection.gc.ca/food/requirements/preventive-controls-food-businesses/shelf-life-studies/eng/1518010592756/1528203595232>

<https://www.inspection.gc.ca/food/requirements-and-guidance/labelling/industry/date-markings-and-storage-instructions/eng/1328032988308/1328034259857?chap=0>