

## Is Shelf-life Testing Right for You?

### Why perform shelf-life testing?

Shelf-life testing determines how long a food product can be sold before its quality declines, affecting its taste, smell, and appearance. This information is crucial for food producers to guarantee their product remains fresh and enjoyable until consumed. Customers look for shelf-life information when buying food, and grocery stores need it to ensure the product fits into their logistics and remains sellable for a set period.

### When is the right time in my product development to perform shelf-life testing?

Perform shelf-life testing after you've settled on your recipe and packaging. Since the formula, production, and packaging can impact shelf-life, test when these elements are unlikely to change. If you later change any component, like an ingredient or packaging, retest to ensure the shelf-life is still accurate for the new version of your product.

### Is a separate shelf-life test required for each SKU in my product line?

Yes, with few exceptions. Usually each SKU contains different ingredients or is made with different formulas, and different formulas can cause shelf-life to vary significantly. Therefore, each SKU in your lineup should be tested separately.

### How does shelf-life testing work?

Shelf-life testing begins with a meeting with a food scientist to plan the test tailored to your product. You'll decide together what quality loss means for your product. The product is then stored under typical conditions. At set times, a team of food scientists evaluates its sensory qualities against a fresh or preserved control sample. If the product's quality drops below the acceptable level, it's deemed to have passed its shelf-life.

### Do these prices include safety and microbiological tests?

The quoted prices cover safety tests like pH and water activity at each test interval, which are included at no extra cost where needed, though not all products require these tests. Microbiological testing, which isn't usually necessary for shelf-life studies or for most small-scale food businesses, is not included in the base price. However, for perishable items, baby food, or products outside of safe pH or water activity levels, we offer microbiological testing at Colorado State University for an extra charge. This will never be done without your agreement and consent.

### What are the testing options, and which option should I choose?

Real-time shelf-life testing (RTSLT) is like watching your shelf-life test in a slow-motion movie. This type of test monitors how long your product stays good under the product's normal storage conditions. You'll need to wait as long as the product's expected shelf-life—months or years for some products—to see if it meets longevity expectations. This testing is often for refrigerated items at about 40°F (4°C), but it's also used for frozen goods at 0°F (-18°C) or some shelf-stable products.

Accelerated shelf-life testing (ASLT) is like doing your shelf-life test in a time machine, or watching it on fast-forward. Accelerated shelf-life testing (ASLT) speeds up aging by storing products in high temperature or humidity to quickly estimate their longevity. Typically, one week in these conditions equals one month of normal aging. Food scientists apply a formula to predict the product's actual shelf-life in normal storage. ASLT is mainly for shelf-stable and some frozen foods, but seldom for refrigerated items.

Combined ASLT/RTSLT Testing offers the best mix of fast and reliable shelf-life data. While ASLT provides a fast estimate, RTSLT gives more precise results. We suggest doing both tests together, especially for products with a shelf-life of one year or more. By starting both tests simultaneously, you quickly gain an initial lifespan estimate to share with partners, while the RTSLT confirms this estimate over time. And, since there's an overlap in testing procedures, we offer a discounted rate for the combined service.

Abuse Testing measures how many times a product can be mishandled before its quality worsens. Take ice cream, for example; it warms up on the drive home and refreezes in the freezer. If it's repeatedly thawed for serving and refrozen, how many cycles can it withstand before the taste, texture, or look deteriorates? This testing helps determine the best package sizes and instructs consumers on proper handling. The specifics and costs of these tests vary per product and are decided after consultation with our team.

**How many samples should I send you for testing?**

When sending samples for testing, start with the number of tests (for example, 12 for twice-weekly testing over 3 months), then add 20% more to cover potential damage or unexpected extended shelf-life, which would give you about 14 samples. You'll also need to send control samples; sometimes as many as the test samples, which would double your total. Plus, include one extra for initial assessment to record the product's starting condition. Exact numbers and testing plans will be finalized with the food scientist.

**How should my samples be prepared?**

For shelf-life testing, send your products as they'll be sold, with the final recipe included and the production date marked. Ensure consistency in production and use the retail packaging, clearly naming the product if multiple types are tested. Transport them as they would be stored. Don't worry if the label isn't final, as long as the product is named and dated. Ingredients or nutrition details can be emailed and aren't needed on the package. If your product comes in different sizes but the same packaging type, just send one size for testing. Different packaging types should be tested separately.

**What does shelf-life testing cost?**

<u>Expected Shelf-life of Product</u>	<u>Typical Testing Interval</u>	<u>Approximate Expected Number of Tests</u>	<u>Real-Time Price</u>	<u>Accelerated Price</u>	<u>Combined Accelerated with Real-Time</u>
≤ 3 months	Twice weekly	12	\$400	\$600	\$900
> 3 ≤ 6 months	Weekly	12 -24	\$800	\$1000	\$1250
> 6 ≤ 12 months	Biweekly	12-24	\$1200	\$1800	\$2000
> 12 ≤ 24 months	Monthly	12-24	\$2000	\$2200	\$2400
> 24 months	TBD	TBD	TBD	TBD	TBD
Abuse testing	Product-dependent	Product-dependent	N/A	N/A	N/A