Building a Dairy Shelf-Life Study

Sarah Masoni
Oregon State University
Food Innovation Center
August 20, 2025

Powered by Twistly

Agenda

1. Definition of Shelf Life
2. Planning the Study
3. Data Analysis
4. Objectives of the Study
5. Testing Methods
6. Interpreting Results
7. Compliance and Regulations
8. Save your questions until the end.

Powered by Twistly

Study Objectives

Confirm the dairy product's shelf life through rigorous testing methods, ensuring safety and quality during consumption while meeting industry regulations.

Shelf Life Verification

Identify the specific dairy product to be tested, ensuring it meets standards for processing, handling, and market requirements while allowing valid shelf life evaluation.

Product Identification

Powered by Twistly

Study Plan & Parameters

Outline the essential elements to be decided for conducting a shelf-life study. Important aspects include the duration and conditions under which testing will be carried out.

Microbiology, Sensory, Physical&Chemical

Powered by Twistly

Testing & Sampling

Set clear protocols for microbiological testing to ensure accurate identification of microbial growth levels in dairy products.

Microbiological Testing

Create robust criteria for sensory testing focusing on taste, smell, and texture evaluations of dairy products for consumer satisfaction.

Sensory Testing

Establish effective methods for physical testing to analyze properties such as viscosity, color, and temperature of dairy during shelf life testing.

Physical Testing

Powered by Twistly

Data & Results

Detailed results suggest areas of concern, primarily in microbiological growth. Sensory evaluations indicated some quality decline in aged product.

Test Type	Result	Notes
Microbiological	Positive growth observed	Sample 3 showed significant growth
Sensory	Good taste	Aged samples rated lower
Physical	No change	Stable for initial duration

Powered by Twistly

Conclusion & Compliance

- Research findings underscore the importance of accurate shelf-life determination for dairy products.
- Shelf-life study revealed essential insights integral to understanding product longevity.
- Regulatory compliance is paramount, necessitating adherence to labeling guidelines.
- Microbiological testing was critical in identifying growth risks during storage periods.
- Visual data analysis indicates significant trends influencing product quality and safety.

Powered by Twistly

Shelf Life & Pathogen Testing

Sarah Masoni
Oregon State University
Food Innovation Center
August 20, 2025

Powered by Twistly

Agenda

- Purpose of Tests
- Best Practice Recommendations
- Summary & Key Points
- Practical & Cost Factors
- Regulatory Expectations

Powered by Twistly

Purpose of Tests

Shelf-Life Studies vs.
Pathogen Testing

Powered by Twistly

Regulatory & Testing

Testing protocols are integral to validation studies and environmental monitoring, typically taking place during crucial moments in shelf life assessments to guarantee product safety throughout its lifecycle.

Testing Practices

In the U.S., the FDA and USDA implement zero-tolerance regulations regarding Listeria and Salmonella pathogens in ready-to-eat foods to ensure consumer safety and prevent foodborne illnesses.

Regulatory Policies

Powered by Twistly

Example Shelf-life Grid

Day	Temp	Sensory Panel N	Units/Sensory	Retain Units	Total Plate Count (reps)	Coliform/E. coli (reps)	Yeast & Mold (reps)	Lactic Acid Bacteria (reps)
0	Refrigerated (4°C)	4	1	1	3	3	3	3
0	Abuse (10°C)	4	1	1	3	3	3	3
14	Refrigerated (4°C)	4	1	1	3	3	3	3
14	Abuse (10°C)	4	1	1	3	3	3	3
28	Refrigerated (4°C)	4	1	1	3	3	3	3
28	Abuse (10°C)	4	1	1	3	3	3	3
42	Refrigerated (4°C)	4	1	1	3	3	3	3
42	Abuse (10°C)	4	1	1	3	3	3	3

- Only **4 timepoints** (Day 0, 14, 28, 42
- Two storage conditions: **Refrigerated (4°C)** and **Abuse (10°C)**.
- Four key microbiological tests with **replicates**.
- Sensory panel numbers, units per sensory session, and retain units.

Powered by Twistly

Practical & Cost Factors

Pathogen tests must follow strict biosafety protocols, necessitating specialized laboratories for safe handling.

Biosafety Protocols

These tests are often costly and time-consuming, making routine testing schedules impractical for many facilities.

Cost Factors

Implement testing strategically at key timepoints to optimize costs and ensure safety when necessary.

Cost-Effective Options

Utilize testing only when essential, such as during validation, reformulation, or when mandated by regulations.

Best Practices

Powered by Twistly

Best Practice Recommendations

Understand the category your product will live in and design your product to meet the category shelf-life expectation.

Powered by Twistly

Planning worksheet

Example, Strawberry Yogurt

Section	Field	Example Entry
Product Info	Product Name	Strawberry Yogurt
Product Info	Category	Yogurt / Cheese / Milk / Other
Product Info	Processing Method	HTST Pasteurization
Shelf Life Goal	Target Shelf Life (days)	30
Shelf Life Goal	Purpose of Study	Verify existing shelf life
Study Design	Timepoints (days)	0, 7, 14, 21, 28, 35
Study Design	Storage Conditions	4°C, 10°C (abuse)
Testing Plan	Microbiology Tests	TPC, Coliform, Yeast & Mold, LAB
Testing Plan	Sensory Attributes	Flavor, Color, Texture
Testing Plan	Physical/Chemical	pH, Viscosity
Sampling	Replicates per Test	3
Sampling	Retain Units	1 per timepoint
Data Collection	Recording Method	Digital Log Sheet
Notes	Special Considerations	Include abuse condition for export validation

Powered by Twistly

Summary & Key Points

- Shelf life studies focus on quality and spoilage over time.
- Pathogen testing mandates zero tolerance in ready-to-eat dairy products.
- Practical costs and biosafety protocols complicate frequent pathogen testing.
- Regulatory bodies enforce strict testing protocols for food safety.
- Best practices encourage optional testing under specific conditions.

Powered by Twistly

Thank you!

Contact information:

Sarah.masoni@oregonstate.edu

fic.oregonstate.edu

Powered by Twistly