



COOPERATIVE EXTENSION

College of Agriculture, Forestry and Life Sciences

Product Testing Fact Sheet

Introduction to Product Testing

It is important to test your food product to make sure that it will be safe to eat once it is purchased by your customers. Foods that do not meet certain specifications can encourage the growth of bacteria which can cause people to get sick (foodborne illness). A law by the Food and Drug Administration (FDA) called Title 21 provides specifications for different food products to minimize bacterial growth. The SC Department of Agriculture (SCDA) is contracted by FDA to ensure safety of SC foods.

This fact sheet provides important information about the Title 21 requirements and gives detailed instructions for getting your product tested through Clemson University.

Objective of Product Testing

To make sure consumers get a safe food product that does not encourage the growth of bacteria, leading to foodborne illness.

To protect you and your business: If someone gets sick after eating your product you can be held responsible (a lawsuit could be brought against you).

Description of What is Being Analyzed During Product Testing at Clemson University

Acidity and water activity provide information about the potential for bacteria to grow in food. The more acidic the food (low pH) and the less water available in the food (low water activity), the less likely the food will promote bacterial growth.

Federal and state food regulations state that a shelf-stable product that does not require refrigeration must have a water activity ≤ 0.85 and a pH ≤ 4.6 . Sushi rice pH < 4.2 .

ACIDITY – measurement of the pH of the food. ([pH ranges of some common foods](#))

pH: ≤ 4.6 – “acidic food” (Prevents the growth of harmful bacteria)

pH: ~ 7.0 – neutral

pH: ≥ 8.0 – alkaline

WATER ACTIVITY – amount of “free” water (water available to grow bacteria) – Goal is \leq

0.85. (Examples of the amount of [water activity found in common foods](#))

NUTRIENT ANALYSIS – nutritional content of the food product’s ingredients and quantity are analyzed using a food ingredient database which will then generate a nutrition label with all the necessary information in the correct format. We will send you the label in a format that you can take to a printer and use on your product.

ALCOHOL AND MEAT PERCENTAGES – The amount of alcohol or meat in the product. Products that contains more than 3% raw or 2% cooked beef, pork, chicken, or lamb (except rabbit, which is regulated by SCDA) will be regulated by the SC Meat and Poultry Inspection Department (SCMPID). Alcohol products that contain more than ½ of 1% or 0.5% alcohol are regulated by Alcohol and Tobacco Tax and Trade Bureau (TTB).

For this calculation all ingredients and final batch must be sent in gram weight (or ml volume for liquids). The preparation method including time and temperature must also be included.

To calculate the percentage of alcohol, the USDA Table of Nutrient Retention Factors will be used to determine the amount of ethyl alcohol retained in the product after thermal processing. ([USDA Table of Nutrient Retention Factors](#))

The formulas for calculation are show below:

$$\% \text{ Alcohol} = \left[\frac{\sum (A \times \text{ABV} \times R)}{F} \right] \times 100\%$$

Where A = the Amount in gram weight or mL volume

ABV = the % ABV of the ingredient

R = the Retention factor

F = the Final cooked amount of product

$$\% \text{ Meat} = \left[\frac{\sum A}{F} \right] \times 100\%$$

Where A = the amount in gram weight or mL volume

F = the final cooked amount of product

GLUTEN – determination of gluten allergen present in food product. One representative sample is taken from each submitted sample to perform the gluten test. The EZ Gluten test is used to determine if the allergen is present. This test has been validated and certified by the AOAC Research Institute and has a minimum detection level of 10 ppm of gluten.

The results of the test indicate the positive or negative presence of gluten. This result does not indicate that the product contains zero gluten, but if present, it contains less than 10 ppm of gluten. The Food and Drug Administration states that products can be labeled as “gluten free” if they contain less than 20 ppm of gluten. The full FDA gluten labeling regulation can be read at this link:

<http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ucm402549.htm>.

Submitting a Food Product for Testing

Print and complete the “Product Testing and Nutritional Labeling Request Form” available online at the Clemson Extension Food2Market website:

www.clemson.edu/extension/food2market. No substitutions for this form will be accepted.

This form must be completed in its entirety and submitted with product samples and payment. Failure to submit this completed form will delay product testing results.

Mail the completed “Product Testing and Nutrition Labeling Request Form” along with one sample from four different batches (4 samples total per product) and check** made payable to “Clemson University” to:

Clemson University
c/o Dr. Julie Northcutt; Product Testing Laboratory
Department of Food, Nutrition and Packaging Science
223 Poole Agricultural Center
P.O. Box 340316
Clemson, SC 29634-0316

*Note: UPS, post office, and/or FedEx sometimes question this address. Please tell them to send the package to the address above exactly as listed. It will get to the correct location by using this address. Packages must include Dr. Julie Northcutt's name as listed above. If not included, we cannot ensure that samples will be tested in a timely manner.

Products must be mailed to the address listed above. Absolutely no in-person deliveries of product samples will be accepted.

Broken, leaking or improperly sealed and marked samples will not be tested.

If you are sending any products that are perishable, refrigerated or frozen please mark on the outside of the package if the box needs to be refrigerated or frozen upon arrival. Also, please notify Adair Hoover (cpepe.edu) that a frozen/refrigerated package is coming.

Testing four batches allows us to demonstrate to SCDA that the product is consistent from one batch to the next. Examples of a sample: 1 sample = 1 cup salsa, BBQ sauce, etc. or 1 item such as 1 muffin, 1 piece of candy, etc.

Sushi rice testing requires samples of RICE from four batches and should be mailed refrigerated. For detailed instructions refer to the Sushi Rice Testing Fact Sheet and Request Form.

Product samples do not need to be sent with the form and payment when only a nutrition analysis is being performed on your product. Samples are required for pH and water activity testing only.

Cash cannot be accepted for payment of product testing. Checks should be made payable to “Clemson University” can be accepted at this time. **

Please note that products cannot be accepted when the Product Testing Laboratory is closed. Make sure that samples are not scheduled to be delivered on holidays, weekends or on the following dates:

- March 21-25, 2022
- November 7-8, 2022
- November 23, 2022 – January 10, 2023 (Note that samples received on or after November 25 will not be tested until the lab re-opens in January)
- March 20-24, 2023

For questions about the product testing process please contact Adair Hoover at cpepe@clemson.edu or 864.986.4313. Do not call Clemson University’s Department of Food, Nutrition and Packaging Science. This office is unable to answer any questions regarding product testing.

The Product Testing Laboratory is not responsible for lost, spoiled or broken samples.

** We now accept major national credit cards! Please see our website [Food2Market | College of Agriculture, Forestry and Life Sciences | Clemson University, South Carolina](#) for details.

There is a 3% convenience fee for this service. **

Test Results

Please allow a minimum of four (4) weeks for testing results to be returned. Clemson University is an educational institutional faculty, staff and employees have other responsibilities in addition to working with the product testing lab.

A copy of your results will be sent to you and the SCDA (or other applicable regulatory authority) via e-mail by default or by mail if e-mail is not available. Maintain a copy of these results for your records as the SCDA (or other applicable regulatory authority) can audit your process at any time and you will be held liable if you do not have evidence of your product testing.

Interpreting Your Results

Products classified as an acidic food ($\text{pH} \leq 4.6$) can continue to be produced and marketed within an inspected and approved facility.

A co-packer is a food processing plant that will produce and package your food product for you (AKA co-packers) [List of Co-Packers](#)

You may rent space from a co-packer or shared kitchen in order to make your product or you can hire workers at the co-packer to make the product for you.

Production of food products in home kitchens is not permitted.

If your food product is not classified as “acid”, you will receive recommendations about how to proceed which may include, but are not limited to, product heating, use of sterilized bottles for packaging, and attendance at a [Better Process Control School](#). You will also be required to schedule your process with the [FDA](#).

Parisi¹, M. A., E. L. Steinberg², and J. K. Northcutt³. 2012. Product testing and nutrition labeling factsheets. Prepared for the Department of Food, Nutrition and Packaging Sciences, Clemson University. ¹Assistant Professor, Winthrop University, Rock Hill, SC and Adjunct Assistant Professor, Clemson University; ²Graduate Research Assistant, Clemson University; ³Professor, Clemson University.