ACIDIFICATION AND FERMENTATION

HACCP GUIDANCE

This guidance is for food service operators who want to commercially prepare acidified or fermented foods and do not already have an approved Hazard Analysis Critical Control Point (HACCP) plan.

For Retail Operators

Rev 2.0-5/23

Carson City Health & Human Services
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Acidified and Fermented Foods Guidance for Food Service

Background Information

Although directly acidified foods and fermented foods are generally considered safe, process failures and contaminated raw materials have resulted in food poisoning outbreaks. As many directly acidified or fermented foods do not undergo a cooking process, there is increased risk that food-poisoning bacteria, and the toxins some produce, may grow in your product to harmful levels. This can easily occur if the pH of your product is above a **pH of 4.6.**

Even heat treated products can be dangerous if not properly acidified. For example: Canning processes create a reduced oxygen environment that can encourage botulism causing bacteria grow. Botulism bacteria create extremely deadly toxins that are not destroyed by further cooking. Proper acidification below pH 4.6 can control the risk of botulism; therefore acidic products (typically < 4.2) may be approved for canning at retail with an approved waiver & HACCP plan. **Canning of *non-acidic* "Low Acid" products is not permitted in retail establishments due to the high risk of botulism.**

To ensure the safety of your food, you should **aim for a pH of <4.2** in your acidic foods so that these products stay well under the **critical pH of 4.6** throughout their entire shelf life. A food safety program for acidified foods must include the use pH meter and standard buffer solutions for calibration.

Using the properties of food acids for the purpose of preservation

Acids, such as the lactic acid produced by fermenting vegetables, act as preservatives by stopping or slowing the growth of food-poisoning and spoilage bacteria. Some food acids are more effective against harmful bacteria than others. Acetic and lactic acids are generally the most effective at inhibiting harmful bacteria but the strength of an acid is not necessarily an indicator of its inhibitory powers. Food can be acidified by direct acidification or fermentation.

A low pH alone is not enough for adequate food safety

Some food-poisoning bacteria, such as *Salmonella spp.*, *Escherichia coli* and *Listeria monocytogenes*, can still survive in food below pH 4.6. Parasites such as cryptosporidium have also survived in acidic foods and caused outbreaks. Therefore, acid is not normally the sole control measure, but is used in combination with other control measures such as heat, salt, sugar, preservatives, etc. (known as hurdles). ***In addition: Good manufacturing practices, a robust food safety program and good hygiene practices, all play key roles in preventing food borne illness*.**

How to Obtain a Waiver to Manufacture Acidified or Fermented Foods

A food service establishment must have a plan approved by the health department before they can manufacture acidified or fermented foods. The plan must identify basic food safety practices such as pH monitoring.

Your establishment must be in good standing and demonstrate control of food safety risk factors in order to qualify for a waiver approval.

1. A waiver request application form must be completed and submitted to your local health inspector for review and approval.
2. If you do not already have a written HACCP plan developed to submit with the waiver, an **Acidification and Fermentation HACCP Supplemental Information Form** may be completed and submitted to help you document the necessary information. This supplemental information completed in detail may be sufficient to function as your food safety "HACCP" plan; however complex processes may require full HACCP implementation.
3. Employees must be properly trained on your process. Training procedures should be included with your submission.
4. All critical control points in your process (CCP's) will require record keeping. Copies of the logs you will use should be included in your submission.

Acidified and Fermented Foods Guidance for Food Service

Directly Acidified Foods

Acids may be added to foods for flavor, but when acids are added to foods for the purpose of preservation (extending shelf life and/or making a product shelf stable) it is critical that the acidity level is carefully monitored to ensure harmful bacteria such as botulism will be controlled. Harmful bacteria may be inhibited by directly adding acid to food. The acid acts in conjunction with heat treatment and/or water activity lowering substances such as salt and sugar. Changes in pH are rapid if not immediate. Larger foods such as pickles may take much longer for the acid to fully penetrate. Sufficient acid must be added to account for any neutralization or absorption of acid by the food.

If the pH of the food is not monitored or the pH fails to fall below < 4.2, the food must be kept refrigerated and the shelf life must be limited to no more than 7 days.

Some examples of direct acidification include:

- Adding vinegar to onions for pickled onions, or to cucumbers for pickles
- Adding vinegar or lime juice to hot sauces or salsa
- Adding vinegar to garlic for garlic in olive oil
- Adding vinegar to sushi rice *(Sushi Rice HACCP Guidance available)*

Packaging for shelf stability if applicable:

- When producing a shelf stable product **validated** processes from reputable sources must be used.
  - If canning/bottling use reputable process such as those found in the *USDA Complete Guide to Home Canning.* *(*https://nchfp.uga.edu/publications/usda/GUIDE06_HomeCan_rev0715.pdf) **Processing times must be monitored and recorded.**
  - Some products may be suitable for hot fill inversion packaging. Typically liquid products with a pH ≤ 4.1 that do not contain significant amounts fiber or pulp may be suited for hot fill (>180°F / invert for ≥ 1 min). You must be able to keep the product heated above 180°F the entire time you are filling bottles. Packaging must be designed for hot fill inversion. (mason jars are not suitable for hot fill inversion) **Fill temperature and time inverted must be monitored and recorded.**
  - A cold filled product intended to be shelf stable may require a pH below 3.3.

Fermented Foods

Fermented food and beverages undergo a microbial process where live yeasts, bacteria, or molds, break down food components into by-products. For example:

- Sugar is converted to a food acid (yogurt, sauerkraut, kimchee)
- Sugar is converted to an alcohol (beer, wine)
- Often sugar is converted into alcohol which is then converted to a food acid (vinegar, kombucha) Controlling the level of alcohol left over in these foods may be an especially important consideration for retail sales. **If you are submitting a process for kombucha or similar brewed beverage you must address how you will monitor alcohol concentrations.**

Fermentation controls food-poisoning bacteria by:

- Competition – where fermentation bacteria compete for available nutrients with other bacteria
- Inhibition – where fermentation bacteria make substances such as acid that inhibit the growth of unwanted microorganisms.
- Displacement – where fermentation bacteria are present in numbers that allow them to be the most numerous organisms on the surface of the food. Bacteria often need to attach to the surface of the food to survive.

Acidified and Fermented Foods Guidance for Food Service

Starter cultures

- To ensure satisfactory and consistent fermentation results, and to inhibit the growth of food-poisoning bacteria, the use of product-specific starter cultures is recommended for many processes.
- Follow the manufacturer's direction regarding dosage and optimum temperatures.
- Its best practice to use a fresh starter culture for each batch; however this may not be possible for all types of fermentation processes.
- Some products such as kombucha often rely on using culture from a previous batch. (back slopping or pitching) Care must be taken to avoid contamination of the culture. Such ongoing cultures must be properly cared for to ensure that they remain viable. Proper concentrations must be used to ensure product safety.
    - For kombucha and similar brewed beverages, the amount dosed or "pitched" from the previous batch should be greater than 10%.
- Lactic acid fermentation of vegetables does not require the addition of any culture because the bacteria are naturally occurring. Some operators choose to add additional lactic acid bacteria to speed up the process but this is not required. Creating optimal conditions to encourage the growth of the naturally occurring cultures is very important.

Healthy viable cultures, especially early in the fermentation are needed to safely ferment foods.

Fermentation temperature

- Each product has an optimum fermentation temperature for a satisfactory result. If temperatures are not ideal for the culture organisms, fermentation will be slowed. Slow fermentation particularly during the initial stages may allow for the survival of any harmful microorganisms that may be present. On the other hand, fermentations that occur too quickly may result in poor quality. Maintaining consistent optimal temperatures can achieve a balance between quality and safety needs.
- Optimum temperatures ensure the best flavor and health of the desired culture organisms and should be carefully controlled and measured. If you are unsure of the optimum temperature for your culture, follow recommendations and guidance from the culture manufacturer, or seek expert advice. University extension services may be a good resource for scientific literature.
- Some fermented products such as Sauerkraut fermentation can take place under variable temperature and time combinations. Examples of recommended fermentation temperatures:
    - Yogurt: typically 105°F to 115°F
    - Milk Kefir: typically 64.4°F to 71.6°F
    - Kombucha: optimal range of 74°F to 84°F
    - Sauerkraut: For obtaining good quality sauerkraut, the USDA recommendation is to store at 70º to 75°F while fermenting. Some processes may utilize longer but acceptable ferments between 60°F to 65°F. At temperatures lower than 60°F, kraut may not ferment. (Warmer temperatures may be result in poor quality)
    - Kimchee: Kimchee processes typically utilize cooler ferment temperatures of 65°F to 68°F (Warmer temperatures may be result in poor quality)

Salt addition for lactic acid fermentation

Adding salt to lactic acid fermentations achieves two purposes. First, it draws sugar-containing juices out of the cabbage/vegetables so that they can be fermented more easily, and second, the high salt concentration inhibits the growth of most of the microorganisms present on the cabbage/vegetables. The microbes best suited to grow under these high salt conditions are lactic acid bacteria of the genera *Leuconostoc* and *Lactobacillus*. These bacteria become the dominant microorganisms within the community and ferment the plant sugars to produce lactic acid as a waste product.

- Lactic acid fermentations must use a salt concentration specific to the type of product. ***Trusted recipes should be utilized and ingredients should be carefully weighed to achieve appropriate salinity levels.***
    - Sauerkraut recipes typically range between 1.5% to 2.5% salinity (Below 1.5% may result in spoilage)

Salt addition for lactic acid fermentation - continued

- Kimchee recipes may vary depending on time and possible rinsing. Optimum salt concentration during kimchee fermentation is approximately 2-3%. Many processes may salt the cabbage at 5 to 10% followed by a rinse step resulting in a final salt concentration that may still be as much as 3-6%. Some processes may use as much as 15% alt for shorter durations.

- Use appropriate salts, typically canning salts or pickling salts are good choices. Table salt or iodized salt may affect quality and is generally avoided.
- **To calculate what percentage salt you are currently using, use the following calculation**:
  - Divide the amount of salt by the amount of vegetables and multiply it by 100.

$$\frac{\text{Amount of salt}}{\text{Amount of vegetables}} \times 100 = \text{percentage of salt}$$

Note: both vegetables and salt must use the same unit of measurement, such as grams.
For example, when making sauerkraut you are using 2 kg of cabbage and 40 g of salt.

$$\frac{40\text{g}}{2000\text{g}} \times 100 = 2\%$$ (Therefore, your recipe uses 2% salt.)

- **If you do not know how much salt to use in your formulation, use the following calculation:**
  - To calculate a 2% salt dosage, for example, use the following calculation.

Weight of vegetables X 2% = grams of salt required.

Note: both vegetables and salt must use the same unit of measurement, such as grams.
For example, if you are using 2 kg of cabbage your recipe should contain 20 g of salt.

Duration of fermentation

- Fermentation must be as rapid as possible to ensure harmful bacteria do not grow. The time taken to achieve a pH drop to below 4.6 must be within the typical period for your product type. You should observe the pH drop happen within a consistent time frame with each batch you produce. If you cannot achieve this repetition you should review your processes. **Retail establishments should target a pH of 4.2 for additional safety which may take slightly longer than specifications developed for 4.6.**
- Some products should reach target pH levels within a matter of hours; however lactic acid fermentations may take several days to fall below 4.6 and then 4.2.
- Examples of ferment duration and pH:
  - Yogurt will typically achieve a pH of less than 4.6 within 4-6 hours. Most yogurt processes should never take longer than 10 hours to drop below 4.6. Discard product that fails to reach < 4.6 after 10 hours. (CCP)
  - Milk kefir must achieve a pH ≤ 5.0 (CCP) within 24 hours. Milk kefir is considered safe once it reaches < 4.5 (CCP)
  - Kombucha fermentation is typically 7-10 days. If the pH does not fall below 4.2 in seven days the culture is most likely contaminated or the fermentation temperature is too cold. Product should be discarded if it fails to reach < 4.2 after 7 days. (CCP)
  - Sauerkraut has a much longer fermentation process and may take as much as 21 days to fall below 4.6. (Additional fermentation may be desired for flavor development)Product that fails to fall below 4.6 within 21 days should be discarded. (CCP)

After Fermentation

- Refrigerate finished product at < 41°F to stop the fermentation process. (Fermentation may technically continue, but at a much slower rate)
- If canning/bottling to make the product shelf stable a **validated** process must be used such as those found in the *USDA Complete Guide to Home Canning.* **Processing times must be monitored and recorded.** *(*https://nchfp.uga.edu/publications/usda/GUIDE06_HomeCan_rev0715.pdf)

How to Measure the pH of Food

Remove a sample: Always remove a small sample from your product and test this sample. Sticking your pH probe directly in your main batch can cause contamination. (i.e. A probe may be unclean or glass from a cracked electrode could potentially fall into your product)

Prepare your sample: Samples should be tested at a constant temperature, preferably room temperature. Hot or cold samples may result in inaccurate readings. Rinse the pH electrode between samples. If your product is a mixture of solid and liquid foods, (such as pickled vegetables) both the liquid and the food must have a sufficiently acidic pH reading. You must measure the pH of the food itself after the brine has had time to fully penetrate. Strain
a sample of vegetable matter out the brine and blend the vegetable matter into a puree or slurry.

Dilute sample if using a pH meter designed for liquids: Some of the less expensive pH probes on the market are designed for testing liquid products. Thicker slurries may be tested with a liquid type pH meter if the sample is properly diluted. A sample may be diluted with a small amount of deionized water without modifying the pH. If deionized water is not available, a small amount of distilled water will generally suffice. (Do not dilute with tap water because tap water will most likely change the pH reading.)

pH meter care: pH meters are delicate instruments and should be handled with care. Meters typically require daily calibrating when in use. Follow the manufacturer's instructions carefully. Learning to calibrate, operate, and care for a pH meter can often take some practice.

- Follow the manufacturer's instructions to make sure it is cleaned properly. The electrode can get food build-up on it from testing which will make it inaccurate. Most probes may be gently rinsed with warm water tap between products.
- Wiping of most electrodes should be kept to a minimum. Kim wipes are preferred for wiping a pH electrode when necessary but may not be available to small operators. If Kim wipes are not available, use only soft facial tissues to wipe the electrode. (They must not have added oils like lavender or aloe vera)
- When the pH meter is not in use, follow the manufacturer's instructions for correct storage. It may need to be stored in distilled water or a commercial storage buffer solution.
- When purchasing a pH meter, ensure you also purchase a sufficient amount of calibration buffer solutions. (4 buffer and 7 buffer) Only use clean pH buffer solutions for calibrations. Rinse the probe gently with deionized or distilled water before moving from one calibration buffer to the next.
- It's also advisable to purchase an extra electrode and set of batteries so that you are prepared for when replacement is necessary.

Acidified and Fermented Foods Guidance for Food Service

Special Processes Requiring a Full HACCP Plan & Process Authority

The Carson City and Douglas County Public Health Regional Partnership reserves the right to require full HACCP and/or process authority review and approval for any process when they deem is necessary. Contact info for several process authorities is available at: http://www.afdo.org/foodprocessing.

If submitting a waiver for a product or process beyond what is described in this guidance document, university extension services may be a valuable resource for finding scientific literature to support your process. i.e. (http://food-safety.guru/) (https://foodsafety.wisc.edu/ssp_acidified_canned_food.html) (https://cfvc.foodscience.cals.cornell.edu/acid-and-acidified-foods/records-and-recordkeeping/)

Facilities submitting processes that do not follow existing validated methods may work with a process authority and/or conduct challenge studies to verify adequate pathogen reduction.

The principles in this supplement do not cover all foods processed by acidification and fermentation such as but not limited to: uncooked meats or uncooked seafood.

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Acidification and Fermentation
HACCP Supplemental Information Form

Any alterations, modifications or changes to an approved HACCP, must be resubmitted for review and approval of the Environmental Health Division.

General Information		
Name of Owner & Title:	Phone:	
Establishment Name:	Email:	
Mailing Address:	City:	Zip Code:

HACCP TEAM Members	
Name	Title / Role

1) List acidification and/or fermentation equipment to be used (such as pH meters, etc.) Or attach manufacturer's specification sheets. Record NA if not applicable.

Containers	
pH meter	
Scale	
Incubator	
Refrigeration units	
Water bath canner	
Other	
Other	

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2) Identify the product you plan to manufacture and the applicable ingredients Alternatively recipes may be attached		
Product / Flavor	Process Type (i.e. direct acidification / fermentation)	Ingredients
i.e. Spicy Kimchee	Lactic acid fermentation	Cabbage, daikon radish, green onions, carrots, chili powder, salt, spices
i.e. Habanero Hot Sauce	Direct acidification	Red bell pepper, habanero pepper, tomato, cilantro, lime juice, apple cider vinegar, salt, spices

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Definitions

Control Points in the acidified foods process are the steps in the flow of food from receiving to service.

Critical Control Points are steps that, when done correctly, can control the possibility of a food borne illness outbreak. An example might include sufficiently acidifying pickles before bottling.

pH development is the primary critical control point (CCP) for acidified and fermented foods.

Critical Limits are the maximum or minimum value to which physical, biological or chemical parameters must be controlled at a CCP to minimize the risk of a foodborne illness outbreak. An example might be achieving a pH below 4.2 for pickles prior to bottling.

Corrective Actions are what is done to correct a step that's gone out of control. For example if the pH is above 4.2, the operator may troubleshoot by calibrating the pH meter and double check the sample to ensure testing accuracy. If an unacceptable pH is confirmed the operator may add additional vinegar to decrease the pH further.

Process Flow Instructions

- Examine the example process flow provided at the end of this document. Make one copy of the example process flow diagram for each type of product that you make. For example, if you make kimchee and sauerkraut you will need a flow for each product. Use a highlighter or other pen to show the actual process flow you use for each product. Cross out any steps you don't use. Mark directional arrows as necessary to make the process clear.
- You may need to list your preparation individually.
- Add any other processing steps not already shown.
- Once you have determined your flow steps, you should be able to draw out your process flow.

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3) Process flow

Describe your process for preparing each acidified food type or recipe type.
Create a simple flow diagram from ingredient receiving to service
(Additional flows may be attached if needed for multiple processes or recipes)

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4) Process steps and critical control points
Is any restricted perseverative ingredient used? (i.e. Calcium hydroxide, sodium benzoate, etc.) If yes, provide details as to how safe levels are ensured. When careful weights must be taken, provide details as to how those measurements will be taken, by whom, and what records will be maintained.
Is your product directly acidified using an acid or naturally acidified by a fermentation process?
List the pH critical limits (CCPs) for your product
How will the pH readings be taken, by whom, and how often?
How will the pH meter be calibrated, by whom, and how often?
What corrective action is taken if the pH critical limit is exceeded?

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Acidification and Fermentation HACCP Supplemental Information Form

4) Process steps and critical control points - continued
Fermented products (*If your product is directly acidified you may skip to step 5)*
Describe the cultures and inoculation process. If using culture from previous batches, how will contamination be prevented and sufficient dosage ensured?
Describe the temperature and duration parameters of your fermentation process
How will fermentation times and temperatures be monitored, by whom, and how often?
What corrective action is taken if fermentation time and temperatures parameters are not achieved?

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Acidification and Fermentation HACCP Supplemental Information Form

4) Process steps and critical control points – continued - Record NA if not applicable.
If you are utilizing a lactic acid fermentation process, what is the target salt concentration used and how will the concentration be achieved and monitored? (i.e. Ingredients weighed and recorded)
If you are submitting a process for kombucha or similar fermented beverage how will you monitor residual alcohol concentrations?
Note: If you are submitting a process for kombucha or similar fermented beverage and you are adding fruit or vegetable juices, only pasteurized juices may be added for commercial sales. How will you ensure only pasteurized juices are used?

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Acidification and Fermentation HACCP Supplemental Information Form

5) Records: Attach copies of all logs to be used for record keeping There must at a minimum be a log for each CCP
Who verifies that records for pH development and other monitoring steps are properly maintained and how often do they review the records?
Where will your records be kept and for how long?
6) Packaging & labeling
Describe in detail how the product will be packaged and labeled.
If utilizing a canning/bottling process describe the process ***Attach documentation from a credible source to support the method used*** How will processing times be monitored and recorded, by whom, how often?

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6) Describe or attach operational procedures for the following subjects
Describe the work area for acidified food processing and describe the methods that will be used to prevent cross contamination (A picture may be attached for reference if desired)
Describe how acidification / fermentation processes and equipment will be limited to responsible trained personnel who understand the risk involved
Describe your procedures regarding operator hygiene and prohibiting bare hand contact with ready- to-eat foods

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Acidification and Fermentation HACCP Supplemental Information Form

7) Describe or attach operational procedures for the following subjects - continued
Describe your cleaning and sanitizing procedures for food contact surfaces
Describe or attach your training program that ensures that staff involved in the acidified food operation understand the concepts required for a safe operation
Describe or attach any additional information relevant to your process as needed

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Acidification and Fermentation HACCP Supplemental Information Form

All acidification / fermentation waiver applications must be submitted to your health inspector for review and approval prior to manufacturing the acidified in your establishment. Applications will be denied if the inspector believes the proposed HACCP plan does not take the proper precautions to keep the public from harm.
By signing and submitting this form to the permit issuing official you are requesting a waiver and establishing a plan to comply with the above requirements as conditions to acidified food manufacturing. Failure to implement processing as described is subject to enforcement. Any additions or modifications to this plan must be reviewed and approved by the permit issuing official prior to being implemented.
I certify that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief.

Signature:	**Date:**

Any alterations, modifications or changes to an approved HACCP, must be resubmitted for review and approval of the Environmental Health Division.

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Fermentation HACCP Flow Example

Ingredient Receiving

→

Storage

Refrigerated ≤ 41°F for TCS foods; Thawing if applicable

→

Weighing

Tip: If using salt for a lactic acid fermentation this step may be a good CCP to ensure safe levels are used

↓

Preparation Steps:

May list as separate steps if needed. (i.e. washing, chopping, blending, inoculation, salting, rinsing, etc.)

→

Fermentation

Time and temperature requirements must be optimal for your product and process type.

If more than one fermentaion phase is used describe all applicable ferments

→

pH Determination (CCP)

according to approved process *(per recipe)*

Some fermentations may require monitoring of an "initial" pH drop

Final pH < 4.6 = critical

Retail: target a final pH of < 4.2

Maintain product pH Logs and pH meter calibration records

*Deadly bacteria including salmonella and E.coli O157:H7 may sometimes survive in acidic environments. Botulism can grow in bottled products if the pH of the food is not below 4.6. Carefully monitored acidification *(combined with additional preventative measures "hurdles")* is necessary to produce safe acidified foods.

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Packaging

(Be specific as to the type of packaging)

←

Optional: Thermal Processing for Shelf Stability

(i.e. water bath canning)

Maintain Records

↓

Labeling

→

Storage

*≤41°F for products that are not shelf stable

*Ambient for properly processed shelf stable products

→

Service / Retail

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Employee Training Log

Employee: _____

Description of Training	Date	Trainer Initials

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Ingredient Weight Log

Product / Flavor:

Batch :	Date :	Ingredient	Target Weight	Weight Measured	Initials

Batch :	Date :	Ingredient	Target Weight	Weight Measured	Initials

Batch :	Date :	Ingredient	Target Weight	Weight Measured	Initials

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Acidification Log

Check pH Meter Calibration at least daily when in use. Use clean 4 buffer and 7 buffer solutions at room temperature.

Product/ Flavor:

Batch ID	Date & Time Fermentation and/or Acidification is Initiated	PH Meter Daily Calibration		*pH Check After Initial Drop _____ Max					**pH of Finished Product _____ Max			
		Reading 4 Buffer	Reading 7 Buffer	Date & Time of pH check	pH of Sample	Time Between Initiation and pH Check?	Corrective Action (if pH is above max)	Initials	Date & Time of pH check	pH of Sample	Corrective Action (if pH is above max)	Initials

** Record applicable initial drop pH spec for your product: Dependant of product / process type*

*** Record applicable spec for your finished product: Usually < **4.2** for retail products for safety purposes.*

The pH should consistently fall below the maximum pH specification by the initial check. Acidification must be as rapid as possible to ensure harmful bacteria do not grow. The time taken to achieve an adequate initial pH drop must be within the time periods normal for your product(s). You should observe the pH drop happen within a consistent time frame for each batch you produce. If you cannot achieve this repetition you should review your processes.

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Thermal Processing Log - Water Bath Canning

Check pH Meter Calibration at least daily when in use. Use clean 4 buffer and 7 buffer solutions at room temperature.

Product/ Flavor:

Batch / Test ID	Date	PH Meter Daily Calibration		Processing			Post-Processing			
		Reading 4 Buffer	Reading 7 Buffer	*pH of Sample Before Processing	Boiling Water Bath Process Time Spec:	Initials	pH after processing (Equilibrated) Must be < 4.2 CCP	Visual Closure Inspection / Vacuum	**Corrective Action Needed? Y/N	Initials

***Ideally the pH of the product should already be <4.2 at the time of processing.** Adjustment / corrections are more easily made prior to processing. **The pH of the finished product should consistently fall below 4.2.** Acidification must be as rapid as possible to ensure harmful bacteria do not grow. The time taken to achieve an adequate initial pH drop must be within the time periods normal for your product(s). You should observe the pH drop happen within a consistent time frame for each batch you produce. If you cannot achieve this repetition you should review your processes.

**** If corrective actions are necessary, record the details of the actions taken on the back of this sheet**

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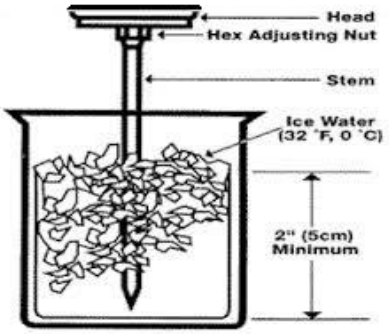
Thermometer Calibration Log



Instructions: 1) Fill a small container with ≈ 1/2 ice and 1/2 water. Crushed ice works best. 2) Wait about 2 minutes for the water to cool to ice point. 3) Insert the probe into the ice water solution. Dial thermometers must be inserted a full 2 inches. 4) Stir gently and wait for the reading to stabilize. 5) Check accuracy in boiling water for thermometers used to monitor cook temps and hot foods. Boiling water should read approximatlly 203°F. 6) If the thermometer does not read within ± 2°F adjust or replace the thermometer. Dial thermometers can be adjusted by twisting the hex nut under the dial. Ensure thermometers are most accurate in the temperature range for which they are actually used.

Thermometers must be within accurate within **±2°F**. If reading is accurate, no calibration is necessary and **N/A** may be recorded in the "after" column. Non-adjustable thermometers must still be checked for accuracy and replaced when necessary.

Date	Time	Thermometer	Ice Point **32°F**		*Boiling Water **203°F**		In Spec Y or N	Initials
			Reading before calibration	Reading after calibration	Reading before calibration	Reading after calibration		

* The temperature at which water boils changes in relationship to altitude. Carson City Nevada is approximatly 4400 feet above sea level

Return this sheet to the owner / manager when completed

Verified by: _____ Date: _____

Carson City Health and Human Services
Environmental Health Division
900 E Long St. Carson City, NV 89706
Tel: (775) 887-2190
Email: eh@carson.org

REQUEST FOR FOOD ESTABLISHMENT WAIVER

As defined by NAC 446.039, a health hazard or nuisance may not result from the granting of the waiver in the opinion of health authority.

General Information			
Name of Person Requesting Waiver:	Title:	Establishment:	
Phone:	Cell:	Email:	
Street Address:		City:	Zip Code:
Mailing Address:		City, State:	Zip Code:

Type of waiver requested (Check one)		**HACCP** Food Safety Plan Required?
◯	Smoking food as a method of food preservation rather than as a method of flavor enhancement (NAC 446.183(1)).	YES
◯	Curing food (NAC 446.183(2)).	YES
◯	Using food additives or adding components, including, without limitation, vinegar: (a) As a method of food preservation rather than as a method of flavor enhancement; or (b) To render a food so that it is not potentially hazardous (time/temperature control for food safety) (NAC 446.183(3)).	YES
◯	Packaging food using a reduced oxygen packaging method, except as specified in this chapter, where a barrier to *Clostridium botulinum* in addition to refrigeration exists (NAC 446.183(4)).	YES
◯	Operating a molluscan shellfish life-support system display tank used to store and display shellfish that are offered for human consumption (NAC 446.183(5)).	YES
◯	Custom processing animals that are for personal use as food and not for sale or service in the food establishment (NAC 446.183(6)).	YES
◯	Preparing food by another method that is determined by the health authority to require a waiver (NAC 446.183(7)), including but not limited to raw animal foods pursuant to NAC 446.164(4)(b).	YES
◯	Sprouting seeds or beans (NAC 446.183(8)).	YES
◯	Other – Rule modification or waiver request for items not involving specialized processes. *(Attach additional information)*	To Be Determined

Justification:

***Attach** written justification for why you believe the issuing of a waiver will not expose consumers to adverse environmental health conditions; will not create any health hazards; will not create a nuisance; and will protect the health and safety of the public and food service workers.

Check the applicable types of supporting documents you have attached.

☐	Operational plans	☐	Scientific study	☐	Monitoring logs	☐	Validation study
☐	Labeling/disclaimers	☐	HACCP plan	☐	Written procedures	☐	Other

I certify that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief.

Signature:	**Date:**

SECTION BELOW FOR OFFICIAL DEPARTMENT OF HEALTH USE ONLY

Action taken by the Public Health Authority:	
◯ Granted	Denied ◯
Attach reasons for denial or the approval with waiver conditions and effective dates are attached.	
REHS reviewer:	Date:
Manager, EHS:	Date: