



## Fermentation Guidelines Fact Sheet

### General fermentation guidelines

It is crucial that good manufacturing practices including cleanliness and proper hand washing be meticulously followed during all stages of the fermentation process. These practices include:

- During processing, thoroughly wash fresh produce, the preparer's hands, cutting utensils/boards, and all containers.
- Select vegetables that are sound, undamaged, uniformly sized and at the proper ripeness.
- Fermentation vessel must be located in a secure location during fermentation.
- Culture should not be backslopped.
- The absence of oxygen is required during fermentation. Preparer must cover product with liquid to exclude air during fermentation. Seal the fermentation vessel to exclude oxygen and ensure anaerobic conditions.
- If product becomes discolored (pink or dark) it should be discarded. This discoloration indicates spoilage.
- Detailed records during production of temperatures and pH are required.
- Equipment calibrations are required and should be documented.
- Retain records for 2 years (varies for different products).
- Once fermentation is complete, keep product under refrigeration (less than 40 °F).
- Fermented foods that are processed for shelf stability require product testing by a process authority to establish an adequate thermal process specific to the product.
- Fermented foods are not considered acidified and therefore do not require registration with the FDA to sell.

### Fermentation Processes

Food	Optimum Salt Level	Optimum Temperature Range	Time Range to Complete Fermentation
Cucumbers	5-8% (Brine)	59-89.6°F	
Cabbage	2.25% (by weight of cabbage)	60-70°F	*5-6 weeks
		70-75°F	*3-4 weeks
Kimchi	4-6% (brine or by weight)	50-64°F	*5-20 days
Fruit	2-3% (brine or by weight)	50-59°F	2-6 weeks
* Fermentation is complete when product reaches a pH below 4.6			

Food	Starter Culture	Optimum Temperature Range	Time Range to Complete Fermentation
<b>Kombucha</b>	Heat to rolling boil before adding	75-85°F	12 days minimum
<p>Guidelines for Kombucha production:</p> <ul style="list-style-type: none"> <li>• If using a dehydrated starter culture, such as SCOBY, the manufacturer’s guidelines must be followed for rehydration with vinegar.</li> <li>• Fermentation may be performed at lower temperatures. If this is done, holding times must be extended to appropriately compensate for reduced microbiological respiration due to lower temperatures.</li> <li>• The pH must be tested by a Process Authority.</li> <li>• Must be lab tested to confirm that finished product contains less than 0.5% alcohol by volume.</li> <li>• Sterile bottles must be used if any bottling occurs.</li> <li>• Product should be kept refrigerated (below 40°F) once fermentation is complete to avoid further alcohol production.</li> <li>• Product should be labeled as “keep refrigerated.”</li> </ul>			
Additional fermented foods may be evaluated on an individual basis.			

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