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GUIDELINE

SUSHI FOOD HANDLING PRACTICES

Guideline: Sushi Business Food Handling

This Guideline has been developed for Sushi businesses to help identify and control the risks associated with this unique food product.

It is up to the food business to demonstrate compliance. Each business may have different requirements, but the need to produce safe and suitable food remains the same.

This Guideline contains Definitions of terms used (page 6) in addition to the following attachments:

Attachment 1: Standard Acidified Rice Recipes
Attachment 2: pH Measuring Devices & Measuring pH

REMEMBER

Controlling **all** risk factors is essential to help to achieve the delivery of safe and suitable food

Receiving Ingredients

All ingredients must be received in good condition, within its use by date or best before date, sealed or covered, free from contamination, labelled correctly and from a reputable supplier.

Some ingredients will require further checks:

Ingredient	Requirements
Potentially hazardous foods eg fish, chicken, beef	Must be transported under temperature control and received at <5℃
Pre-acidified rice	• Refrigerated transport. • Received at <5℃. • Check that the pH is below 4.6. • Must have been made within 8hours. • Labelled with time and date made from the supplier.
Pre-made sushi	• Refrigerated transport. • Received at <5℃. • Must have been made within 8hours. • Labelled with time and date made from the supplier.

Cross contamination: Storage & Handling

Cross contamination is what happens when bacteria from one food item are transferred to another food item, often by way of unwashed cutting boards or countertops, as well as knives and other kitchen tools, or even unwashed hands. Cross contamination can in turn lead to food poisoning.

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Ensure that raw and cooked or ready to eat ingredients are kept segregated during storage and preparation.

Cross-contamination is also a concern since sushi can be made with both raw and cooked ingredients. To prevent cross-contamination, raw and cooked ingredients must be physically separated during preparation, and different utensils, cutting boards, and surfaces should ideally be used.

Personal Hygiene: At all stages of preparation

When handling food remember the golden rules:

a) Always use the designated handwash basin
b) Ensure that soap and paper towel is provided at the handwash basin at all times
c) Always wash your hands;
   - Before starting or returning to work
   - After using the toilet
   - After handling rubbish
   - After using a handkerchief or tissue
   - After touching your face or hair
   - Before and after handling raw food such as meat/seafood/vegetables
   - Before handling cooked food or ready to eat food
   - After doing any cleaning
   - After handling money
   - In-between glove changes

Temperature Control: Storage, Handling and Preparation

All potentially hazardous raw materials should be kept under refrigeration until ready to be used.

Frozen foods are to be thawed under refrigeration or using a microwave oven.

Prepared potentially hazardous ingredients (e.g. cooked chicken, non- acidified rice) must be placed under refrigeration after being cooked and when not being used.

Preparation time must be taken into account when following the 2hr/ 4hr Rule.

How to use the 2 hour/ 4 hour Rule

Time at temperature between 5℃ and 60℃	Action
Total time less than 2 hours	Refrigerate or use immediately
Total time over 2 hours but less than 4 hours	Use immediately
Total time 4 hours or longer	Throw out

Cooking

Rice needs to be cooked until soft, this will help kill some bacteria. Both boiling water and steam methods will achieve this.

Ensure any other ingredients eg beef, chicken etc, that are cooked on site are cooked to 75℃ or above. Use your probe thermomete r to confirm that the meat is completely cooked.

Rice Preparation: Acidified and Non-acidified

Traditionally a combination of vinegar, sugar and salt solution is added to the rice to provide flavour and texture.

Proper acidification of cooked rice with vinegar recipes helps preserve the rice for temporary handling at temperatures above 5℃, but t he acid level (measured by pH) should be carefully monitored for each batch.

Refrigerated rice is more difficult to form for sushi. For this reason, sushi rice should be carefully protected during handling without refrigeration.

It is best to acidify the rice when it is warm to assure better mixing and penetration of the acid solution.

Type of Rice	pH	Temperature Control
Acidified Rice:	Vinegar has been added to give a pH of less than 4.6. The business must demonstrate that the rice is at pH of <4.6 to be considered as 'acidified rice'. It is best to acidify the rice when it is warm to ensure better mixing and distribution of the acid solution throughout rice.	This rice is considered to be safe when stored at ambient temperature for a maximum of 8hours. Keep rice covered and free from contamination. *Rice that has been out of temperature control must be discarded at the end of the day*.
Non - acidified Rice:	No vinegar has been added; OR Vinegar has been added for a flavour/ texture reason only; OR If the company cannot verify that the pH is <4.6, the rice will be considered non-acidified.	Considered as a potentially hazardous food and must be kept under temperature control or follow the 2hr/ 4hr rule. *This means 2 hours continuously out of temperature control* *Or* *A combined total of 4 hours out of temperature control.*

Use of a standard recipe can assist you achieve the required pH consistently, but the pH of each batch still needs to be tested to confirm it is below 4.6. It is important that the rice is tested in several places to ensure an even distribution of vinegar.

An example of a standard recipe is provided as Attachment 1 - Standard Recipes. Refer to Attachment 2 for a recommended method of measuring pH for your business type.

Cooling: Non Acidified Rice & Ingredients Cooked on Site

It is important that cooked ingredients or rice that will not be acidified to a pH less than 4.6, are cooled safely and that they are kept out of the temperature danger zone.

The cooling requirements of the Food Safety Code which require food to be cooled;

- From 60℃ to 21℃ within 2 hours
- From 21℃ to 5℃ within a further 4 hours.

Keep the non- acidified rice and other cooked ingredients refrigerated until ready to assemble into sushi rolls. Any unused rice or cooked ingredients should be refrigerated until required for later use.

Sushi assembly/preparation

1) Ensure that your work area, equipment, and surrounding premises are free of dirt and grime before use.

2) Bamboo and plastic mats must be cleaned and sanitised regularly through the day. At a minimum cleaned every 2 hours.

3) All contact surface areas and equipment once cleaned need to be sanitised, this includes all sushi assembly machinery and appliances and surfaces.

   There are two methods available to sanitise surfaces and equipment cleaning alone is not sufficient to eliminate bacterial growth.

   a) Heat - To sanitise effectively with heat only, temperature of at least 77℃ and a contact time of greater than 30 seconds is required. Lower temperatures will require longer contact times. If using a dishwasher, check the manufacturer's instructions to ensure adequate temperature/ time is achieved.

   b) Chemical Sanitiser - Chemical sanitisers are generally chlorine or ammonium based compounds. Products appropriate for use in food businesses are available from commercial chemical suppliers and retailers. It is important when using chemical sanitisers that the product is designed for use in food premises and that manufacturers instructions are followed. Some chemical sanitisers require residues to be rinsed off the food contact surface after use. Dilution rates, contact times and safety instructions vary from product to product.

4) Prepare the sushi by rolling (either by hand or using an automatic roller). Ensure that time/ temperature, personal hygiene and cross contamination controls are in place.

Storage/ Display

Prepared sushi is considered a potentially hazardous food once other ingredients are combined with the acidified rice, therefore sushi should be maintained at 5℃ or below during storage and display.

However, as the eating quality of sushi is best when served at room temperature, the following use of the 2hr/ 4hr rule applies to ensure food safety is maintained:

Sushi made with acidified rice (pH below 4.6):

Correctly acidified rice is considered a non- hazardous food, however once it is combined with other ingredients to make the sushi rolls, it becomes a potentially hazardous food.

As a potentially hazardous food, it may be stored or displayed out of temperature control (up to 15℃) **for up to 4 hours after assembly.**

Sushi made with non-acidified rice:

If rice is not acidified to a pH below 4.6, or cannot be verified to be below 4.6 then sushi should be stored and displayed at 5℃ or belo w.

If you choose to store/display food in the danger zone (between 5℃ and 60℃) strict time and temperature controls of the 2hr/ 4hr rule and time must be demonstrated otherwise you will be asked to discard the product.

Distribution

Any food to be transported to another food business should be appropriately labelled, with food intended for further processing to have batch or lot code identification as a minimum. Where information does not need to be on an individual package, all the appropriate information must be provided in documentation accompanying the food or ingredients.

Any food, whether just rice, completed sushi rolls, potentially hazardous foods , e.g cooked chicken, raw seafood, . for distribution to other businesses must be delivered under temperature control of 5℃ or less. All trans port vehicles should be kept well maintained and clean at all times and food should be protected from contamination at all times.

Recall

Businesses supplying, or manufacturing food must have a food recall system in place. The system should be used to retrieve food from the market place if you find that the food may be contaminated in some way and be dangerous to eat after you have sent it on to other food businesses or your customers.

Disposal

All premade rice or sushi that has been held over 5℃ during the day must be disposed of at the end of the business day.

Definitions

Acidified rice	Cooked rice with vinegar added to achieve a pH of 4.6 or less (pH <4.6)
Cleaning	The process of removing food and other types of soils from surfaces, equipment and utensils. Detergents are used to assist removal.
Non- acidified rice	Vinegar has not been added to the rice; OR Cooked rice with vinegar added that does NOT achieve a pH of 4.6 or less; OR Acidified rice where the business cannot demonstrate that the pH is 4.6 or less,
Pathogenic bacteria	Bacteria capable of causing food poisoning. Includes *Salmonella*, *Bacillus cereus*, *Staphylococcus aureus* and some types of *Vibrio* species.
Potentially hazardous foods	Food that has to be kept at a certain temperature to minimise the growth of any pathogenic bacteria that may be present in the food or to prevent the formation of toxins in the food.
Ready-to-eat foods	Food that is ordinarily consumed in the same state as that in which it is sold and does not include nuts in the shell and whole, raw fruits and vegetables that are intended for hulling, peeling or washing by the consumer. For sushi businesses this would include cooked foods such as teriyaki chicken or cooked prawns or foods/products consumed raw such as tuna, other fish and some vegetables.
Sanitising	The process of removing microorganisms from a surface, equipment and utensils using either chemical agents or heat.
Sushi	Ready-to-eat cooked rice (acidified or non-acidified) that has been formed with a variety of ingredients including raw or cooked seafood, fresh chopped vegetables, cooked egg. Product forms can include: • nigiri – small balls of rice with ingredients on top • maki rolls – layers of rice and nori sheets • hand rolls – cone shaped rolls formed by a sheet of nori filled with various ingredients.
Sushi rice	Cooked short grain rice mixed with vinegar and other ingredients such as sugar and/or salt with a pH of 4.6 or less.
Temperature control	Means maintaining food at a temperature of: a. 5℃ or below if this is necessary to minimise t he growth of infectious or toxigenic microorganisms in the food so that the microbiological safety of the food will not be adversely affected for the time the food is at that temperature; or b. 60℃ or above; or c. another temperature – if the food business demonstrates that maintenance of the food at this temperature for the period of time for which it will be so maintained, will not adversely affect the microbiological safety of the food.

For more information

Food Policy & Programs
SA Health
Telephone: 8226 7100
11 Hindmarsh Square, Adelaide SA 5000
www.health.sa.gov.au/pehs/food-index.htm

Attachment 1: Standard Acidified Rice Recipes

Following the recipes and instructions below will assist in making sushi rice that has been properly acidified.

Ingredients	Recipe 1	Recipe 2	Recipe 3
Short Grain Rice	**900g**	**900g**	**900g**
Water	1100 ml	1320 ml	1250 ml
Vinegar	135 ml	99 ml	128 ml
Sugar	57 g	94 g	44 g
Salt	9 g	25 g	8 g

Preparation

- Rinse rice until water is clear.
- Add rice and water to cooker and cook.
- The cooked rice must be kept hot (above 60℃) pri or to addition of vinegar.
- Mix vinegar, sugar and salt and dissolve.
- Place cooked rice in a shallow container (i.e. less than 10 cm depth) rather than deep containers (e.g. rice cooker), to promote cooling and uniform acidification of the rice.
- Pour vinegar mixture over the rice.
- Mix using a slicing action; do not stir.

Appendix 2: pH Measuring Devices & Measuring pH

pH can be measured using a pH meter, pH strips or pH paper.

Pros and cons of each method

1. pH paper

- The paper should be able to read pH in 0.3 units, although it is difficult to distinguish less than 0.6 of a unit.
- Incorrect readings can occur from improper handling (contamination from hands).
- pH paper requires careful handling.

2. pH strips

- The strips should read pH in units of 0.5, although it is difficult to distinguish less than whole units.
- It is easy to use and does not require as careful handling as the pH paper.

3. Hand held digital pH meter

- It reads pH in 0.1 units with certainty.
- Some hand held pH meters also measure the sample's temperature and compensate the measurement for sample temperature.
- It requires calibration before use with at least a single buffer (buffer 4.0 is suitable for acidified rice).
- It comes with instructions but may require some training of operators.

Measuring pH

- Once the vinegar mixture has been evenly mixed, place a small sample (¼ cup) in a clean container.
- Dip the pH strip or stick directly into the rice and compare to colour chart.
- For pH meters, follow the manufacturer's instructions.
- Keep a record of the pH.
- If the pH is greater than 4.6, add more vinegar and mix. Take another pH reading.
- Continue adding vinegar until pH is less than 4.6
- If extra vinegar is needed, sushi rice recipes should be revised to account for the extra vinegar required.

Suppliers

For pH monitoring supplies and equipment, refer to the Yellow Pages Section:

Laboratory Equipment and Supplies

OR

Ask your cleaning chemical supplier for information on pH measuring devices