Sushi safety

Introduction

Sushi is a particular type of Japanese cuisine that combines vinegar seasoned rice with a variety of seafood, meats and vegetables. There are many different varieties of sushi arising from different fillings, toppings, condiments and presentation. Other names for sushi include nigiri, nigirizushi, nori rolls, Californian rolls, maki, makizushi, inari and inarizushi.

Sushi – the risks

There are food safety concerns that are unique to the preparation and service of sushi in retail settings. The rice is best used at room temperature which is a favourable temperature for pathogen growth. In addition, many people prefer to eat sushi at room temperature, which also makes refrigerated storage less desirable.

Raw fish is a common ingredient in sushi and may contain harmful bacteria and viruses. Sushi made with raw fish is often prepared alongside sushi prepared with cooked and vegetable ingredients which increases the risk of cross contamination of cooked products from raw ingredients.

Rice acidification

The addition of vinegar to rice produces an acidic environment discouraging the growth of food poisoning bacteria. To prevent the growth of bacteria, the pH of the rice needs to be maintained at 4.6 or lower. pH levels higher than this provide a better environment for the bacteria to grow. It is important that the pH of rice is tested regularly with a pH meter or strips. Results of these tests should be recorded in a pH log. If the pH of the rice is too high, it is important to either decrease the pH if you are able to do so or discard the product if it has been above 5°C for more than 4 hours.

The acidity of the rice also assists in protecting the other ingredients in the sushi products from bacterial growth.

Temperature control

Even with the acidified rice, sushi is still considered a potentially hazardous food. This is due to the other ingredients that are used in sushi including raw and cooked seafood and chicken. As such, it is important to ensure that all sushi is maintained under temperature or time control.

Ideally all sushi should be maintained at 5°C or below. If sushi is to be stored or displayed at temperatures between 5°C and 60°C a documented time control system should be in place to ensure the ‘4 hour/2 hour’ rule is being effectively applied. This rule states:

- any potentially hazardous food out of temperature control for a total of less than 2 hours, must be refrigerated or used immediately
- any potentially hazardous food out of temperature control for a total of longer than 2 hours but less than 4 hours, must be used immediately
- any potentially hazardous food out of temperature control for a total of 4 hours or more must be discarded.
Due to the acidification of rice, some sushi can be stored outside of temperature control above 5°C. The NSW Food Authority conducted a study modelling food poisoning bacteria with the potential to impact the safety of unrefrigerated sushi. The study concluded that sushi should never be stored or displayed at temperatures above 25°C for longer than 4 hours.

**Food handling**

It is important to ensure all other ingredients used in the making of sushi are clean and free from contamination and are handled as minimally as possible.

All utensils used must be clean and sanitised to ensure bacterial contamination is less likely to occur. It is also important to ensure that raw fish is handled separately to ready-to-eat ingredients including cooked fish, chicken, egg and vegetables to minimise the risk of cross contamination.

**Records**

Maintaining accurate records is important to help ensure the food you are providing is safe. Records that should be kept to demonstrate safe sushi include:

- pH of acidified rice
- Temperature of stored rice and sushi
- Temperature of displayed sushi
- Time control system if used including
- Time that sushi was placed on display
- If sushi is made and displayed immediately, the time it was made must be recorded and
- Corresponding colour, pattern etc used to track different batches and times.

**Australian National Sushi Survey**

An Australian National Survey was undertaken between June 2006 and June 2007 to determine the food handling practices and microbiological safety of retail sushi products. Samples in the survey were tested for:

- pH and water activity of acidified rice (chemical aspects)
- Microbiological quality indicators and pathogens present in sushi
- Histamine levels in raw sushi.

The survey also included a questionnaire on:

- How rice was acidified and stored
- How sushi was prepared and displayed.

**Survey results**

Numerous samples from 89 outlets displaying sushi in enclosed cabinets or moving conveyor belts, often referred to as sushi trains, were randomly sampled from NSW, SA, ACT and NT.

The results of the survey were generally very good with acceptable results for:

- 98.6% sushi rice samples
- 94.6% sushi samples.

Full results and outcomes of the survey can be found in the *Report on food handling practices and microbial quality of sushi in Australia*, July 2008, which is available from the NSW Food Authority website [www.foodauthority.nsw.gov.au](http://www.foodauthority.nsw.gov.au).
A follow up survey was conducted in 2009 by the NSW Food Authority who found the results from this survey were consistent with those from the 2006-2007 study.

For further information

Queensland Health has a variety of fact sheets with detailed information on food safety. Fact sheets can be accessed from the Queensland Health website at www.health.qld.gov.au/foodsafety.

For further information relating to sushi safety or to lodge a complaint regarding a business producing or selling sushi, contact the local government where the food business is located.