

RESEARCH ON FOOD SAFETY KNOWLEDGE AND PRACTICES IN AUSTRALIAN FOOD BUSINESSES

Food Standards Australia New Zealand (FSANZ) has just released the *2007 National Food Handling Survey Final Report*, which presents the results of a major survey of safe food handling knowledge and actual safe food handling practices within food businesses in Australia.

Background

Food borne illness is a potential threat to public health. One of the possible causes of food borne illness is unsafe preparation of food for sale or delivery to the public by food businesses. In order to minimise this risk, a new chapter, Chapter 3 – Food Safety Standards, was included in the Australia New Zealand Food Standards Code (the Code) in August 2000, for application in Australia only. The Food Safety Standards provide a nationally consistent set of food safety requirements for food businesses and include three standards containing requirements relating to food safety practices, premises and equipment. These are:

Standard 3.1.1 *Interpretation and Application*

Standard 3.2.2 *Food Safety Practices and General Requirements*

Standard 3.2.3 *Food Premises and Equipment*.

A fourth, non-mandatory standard, 3.2.1 *Food Safety Programs*, was also included in the Code in December 2000. The intention of including this standard in the Code was to promote national consistency by providing a model for those States and Territories (such as Victoria) who wished to introduce food safety programs ahead of a national requirement.

Australian, State and Territory Governments introduced the new Food Safety Standards into their legislation between 2001 and 2003.

Evaluation of the Food Safety Standards

At the time of introduction of the Food Safety Standards, FSANZ put in place a project to evaluate their impact.

The overall objective of establishing the Food Safety Standards was the protection of public health and safety by producing and selling food for consumers that is not likely to cause food borne illness or contain other physical or chemical hazards. However, as there are many factors affecting food safety, it is not possible to directly link a change in the rate of food-borne illness to the introduction of the Food Safety Standards. Therefore, to assess what effects introducing the standards had on public health and safety, FSANZ has looked at whether implementing the Food Safety Standards has improved food businesses' safe food handling knowledge and practices.

The National Food Handling Benchmark Survey

FSANZ undertook a benchmark survey in 2001, prior to implementation of the Food Safety Standards in State and Territory legislation, as a first step in the evaluation, in order to measure food businesses' food safety knowledge and practices at that time. The benchmark research was undertaken two parts: a Telephone Survey of food businesses to investigate their knowledge and awareness of safe food handling issues; and an on-site Observational Survey,

conducted by local government (council) Environmental Health Officers¹ (EHOs), of actual food handling practices. The 2001 *National Food Handling Benchmark Survey Report* is available on the FSANZ website at: <http://www.foodstandards.gov.au/newsroom/>.

Why did FSANZ commission the 2007 National Food Handling Survey?

The overall purpose of this latest research was to evaluate the effectiveness of the Food Safety Standards in protecting public health and safety, by assessing whether or not there has been an improvement in the safe food handling knowledge and actual practices of food businesses since the introduction of the Food Safety Standards in 2001 and full implementation in 2003.

FSANZ, in association with the State and Territory food regulatory agencies, commissioned the follow-up 2007 National Food Handling Survey (the 2007 Survey) to provide a second set of results, using the same methodology as the 2001 benchmark survey, for comparison with the benchmark survey national results. In 2006, the survey was endorsed by the Implementation Sub Committee (ISC) and placed on the ISC Coordinated Survey Plan for 2006 and 2007 and all jurisdictions participated in the survey. Campbell Research and Consulting was commissioned to conduct the survey.

For the 2007 Survey, sample sizes for both the Telephone and Observational Survey components were increased to allow analysis at the State/Territory level. As a result of a number food safety incidents that occurred at about the time of planning, there was an additional focus on bakeries² and sushi makers³ in the 2007 Survey.

Why were there two survey components?

Two surveys were required to evaluate if both knowledge and practices relating to safe food handling had improved since the introduction of the Food Safety Standards. The Telephone Survey was conducted to measure food businesses' awareness and knowledge of safe food handling practices and determine businesses' staff training practices and sources of food safety information.

In keeping with the 2001 benchmark survey, EHOs were invited to conduct the on-site Observational Survey, in order to utilise their high degree of food handling and food safety knowledge and expertise. EHOs were requested to visit food businesses and observe food handling practices as businesses undertook their normal operations. EHOs then answered the Observational Survey questionnaire based on what they observed. If it was not possible to observe a practice at the time of their visit, the EHOs sought information from the owner/manager or supervisor at the time. Using this methodology, the EHOs could make an expert assessment of whether the businesses' food handling practices were undertaken safely.

How were the telephone and observational survey questionnaires developed?

To allow a robust comparison between the two surveys (pre and post implementation of the Food Safety Standards) both the follow-up Telephone Survey and on-site Observational

¹ EHOs are environmental health practitioners having regulatory responsibility for ensuring compliance of food businesses under respective State and Territory Food Acts.

² For the purpose of this survey, bakeries were defined as a business that prepares fresh bread, pastries and/or pies for sale or distribution.

³ For the purpose of this survey, sushi makers were defined as a business that makes sushi on the premises.

Survey questionnaires were based on the questionnaires used for the 2001 benchmark research.

For the 2007 Survey, the questionnaires were refined to reflect any changes in the food industry between 2001 and 2007, to incorporate extra questions relating to bakeries and sushi makers (observational survey only), and to refine content and wording to allow for effective administration.

Questionnaires for both survey components were designed to reflect the key food safety areas identified in the Food Safety Standards, that is:

- temperature control;
- protecting food from contamination;
- cleaning and sanitation; and
- personal hygiene and staff illness.

The Telephone Survey questionnaire asked further specific questions relating to staff training and food safety information, while the Observational Survey questionnaire included sections regarding a general assessment of the premises, food recalls, food safety programs and specific questions for bakeries and sushi makers.

How many businesses were included in the surveys?

For the 2007 Survey, sample sizes for both survey components were increased to allow analysis at the State/Territory level. A total of 2,340 telephone surveys were completed.

Ninety-six councils across Australia assisted in conducting the on-site observations with a total of 916 observational surveys being completed.

Individual targets were set for bakeries and sushi makers for both survey components, in order to specifically assess the level of knowledge and practice of these businesses.

When were the surveys conducted?

Fieldwork for the telephone survey was undertaken between mid-February and mid-March 2007.

For the on-site survey, observations started in the first week of June 2007 and surveys were accepted up until the end of August 2007.

Who was surveyed?

For both survey components, the types of businesses surveyed included businesses that manufactured, processed or transported food, food retailers, cafes, restaurants, canteens, hospitals, child care centres, and school tuck-shops. The population of food businesses surveyed was obtained using 'Australia on Disc', a commercial product that categorises businesses of all types in Australia.

A random sampling approach was used to obtain a range of food business types, with individual targets set for each State and Territory.

What about New Zealand?

As the Food Safety Standards apply to Australia only, the survey was not conducted in New Zealand.

What did the surveys find?

The 2007 National Food Handling Survey Final Report (available on the FSANZ website at: <http://www.foodstandards.gov.au/monitoringandsurveillance/monitoringandevaluation/1584.cfm>) provides a detailed description of the methodology and outcomes of the two survey components, with analysis of the 2007 results by a range of business demographics including location (jurisdiction and metropolitan/regional), business risk classification⁴ (high, medium or low), and business size. The Survey report also provides a comparison of the 2007 survey national results with the 2001 benchmark survey results.

Overall, comparison of the Telephone and Observational Survey results between 2001 and 2007 demonstrates increased safe food handling knowledge and improved safe food handling practices by food businesses since the implementation of the Food Safety Standards.

Key findings from the Telephone Survey

Temperature control

Between 2001 and 2007, there has been a significant improvement in the knowledge of temperature and times required in handling potentially hazardous food. More specifically, compared with 2001:

- more businesses reported having temperature probes (73% in 2001, 90% in 2007)
- more businesses knew the correct storage temperature for chilled food (78% in 2001, 85% in 2007)
- more businesses knew the correct temperature for holding hot food (77% in 2001, 85% in 2007)
- more businesses knew that potentially hazardous foods (cooked rice (79% in 2001, 95% in 2007) and beef curry (85% in 2001, 94% in 2007)) needed to be kept refrigerated to remain safe for use the next day.

There was a decline in the level of knowledge about the time potentially hazardous foods that are meant to be served hot can be safely left at room temperature.

Protecting food from contamination

There was a significant increase in the number of businesses reporting that their employees wore disposable gloves (74% in 2001, 85% in 2007). Knowledge about the correct use of gloves remained at a very high level; almost all businesses knew that the same gloves should not be used to unpack raw vegetables and slice cold meat (97% in

⁴ Food businesses in both the telephone and observational surveys were classified as high, medium or low risk in accordance with the FSANZ Priority Classification System which is based on the potential risk that the business presents to public health and safety.

2001 and 2007) and that the same gloves should not be used to clean tables and unstack the dishwasher (94% in 2001 and 2007).

There was a decrease in food businesses' knowledge that it was not safe to directly touch ham (90% in 2001, 86% in 2007) and that raw vegetables should not be stored directly above uncovered cooked food in the cool room (88% in 2001, 82% in 2002)

Cleaning and sanitation

The Telephone Survey showed a significant shift in the proportion of businesses that:

- only use dishwasher (12% in 2001, 17% in 2007)
- use a dishwasher some of the time (37% in 2001, 47% in 2007)
- only hand-wash (63% in 2001, 52% in 2007)
- hand-wash some of the time (88% in 2001, 82% in 2007).

There have been significant improvements in food businesses' knowledge that:

- all chemical sanitisers should not be mixed with hot water (53% in 2001, 64% in 2007)
- detergents don't kill micro-organisms (69% in 2001, 73% in 2007)
- a dirty chopping board must be washed before being sanitised (94% in 2001, 96% in 2007).

Knowledge about the use of chemical sanitisers improved with the number of businesses that (incorrectly) thought that chemical sanitisers should never be used after washing plates, cups and eating utensils significantly decreasing from 24% in 2001 to 8% in 2007.

Knowledge about the correct sanitising temperature for hot water significantly decreased from 38% in 2001 to 27% in 2007.

Staff training

In 2007, 89% of food businesses provided training to staff about food safety, a significant increase since 2001 (74%). The most common form of training was informal or on-the-job training (57%) followed by utilising external staff training programs (39%) and induction programs at the workplace (27%).

Staff illness

In 2007, 53% of food businesses surveyed believed that staff with diarrhoea should not be at work at all, while 49% indicated that the employee should avoid anything to do with food or food implements.

Food safety information

Businesses are finding it easier to locate food safety information. Eighty-five percent of businesses in 2007 said that food safety information was easy to find, a significant increase from 68% in 2001. In 2007, the most frequently used sources of food safety information were the local council and Environmental Health Officer (51%), State and Territory government health departments (33%) and industry associations (20%).

The use of websites and food safety auditors as sources of food safety information were not mentioned in 2001, but increased to 17% and 13% respectively in 2007.

Awareness of food safety regulations

More businesses felt informed, well informed or very well informed about current food safety regulations in 2007 (86%) compared to 2001 (81%). However, specific awareness of the new 'national food safety standards' was at a lower level than awareness of current food safety regulations (57% in 2001, 62% in 2007). Of the 62% of businesses that knew about the new national food safety standards in 2007, 55% said they had changed their practices in some way as a result of their introduction. Of those that had not changed their practices, 80% indicated that there was no need as they were already compliant.

Key findings from the on-site observational survey

Temperature control

There were significant increases in several safe food handling practices by food businesses relating to temperature control. Specifically:

- more businesses had a probe thermometer (41% in 2001, 81% in 2007)
- more businesses checked that potentially hazardous food was received at a safe temperature (35% in 2001, 71% in 2007, and more businesses used a thermometer to check delivered chilled food (39% in 2001, 53% in 2007)
- most businesses stored chilled food at or below 5°C (91% in 2001, 97% in 2007)
- more businesses ensured food was cooked to the correct time and temperature (54% in 2001, 87% in 2007).

Food businesses maintained a similar high level of safe food handling practices between 2001 and 2007 in the following areas:

- most businesses held hot food at or above 60°C (92% in 2001, 93% in 2007)
- most businesses had adequate equipment for holding hot food (97% in 2001, 94% in 2007)
- most businesses reheated cooled cooked food within the correct time (90% in 2001, 93% in 2007)
- businesses cooled cooked food within the correct time (85% in 2001, 87% in 2007)
- businesses held displayed potentially hazardous food at the correct temperature (85% in 2001, 87% in 2007).

Protecting food from contamination

Compared with 2001, businesses significantly improved their safe food handling practices in relation to protecting food from contamination in two areas:

- more businesses separated raw and ready-to-eat foods in the cool room (91% in 2001, 95% in 2007)
- more businesses protected displayed food from contamination (91% in 2001, 96% in 2007).

Many safe food handling practices in relation to protecting food from contamination were maintained at a high level of over 90% between 2001 and 2007, including:

- protecting food from contamination when received

- adequate storage space in the cool room for potentially hazardous food
- dry goods protected from contamination
- separate equipment used for raw and ready-to-eat food
- barrier (eg utensils or gloves) used when handling ready-to-eat food
- gloves changed when necessary.

Businesses also continued to protect food from contamination in the cool room (86% in 2001 and 87% in 2007).

Safe food handling practices declined in relation to:

- staff supervision of displayed ready-to-eat food (85% in 2001, 59% in 2007)
- food removed from display disposed of appropriately (not added to new batch the next day) (84% in 2001, 79% in 2007).

Personal hygiene and staff illness

There has been a significant increase in the provision and correct use of hand washing facilities in food businesses since 2001, in the following areas:

- more businesses have sufficient hand washing facilities (83% in 2001, 93% in 2007)
- more businesses have accessible hand washing facilities (89% in 2001, 94% in 2007)
- more businesses have warm running water (85% in 2001, 90% in 2007) and supply single use towels (79% in 2001, 85% in 2007) at the hand washing facility
- more businesses had staff who washed their hands in the designated area (80% in 2001, 88% in 2007).

Businesses maintained their practices between 2001 and 2007 in relation to supplying soap at hand washing facilities (93% in each year). A similar proportion of staff in 2001 and 2007 washed and dried their hands correctly (84% and 87% respectively), and hand washing facilities showed similar evidence of recent use (85% and 84%).

More businesses had a policy for staff who were unwell in 2007 (89%) compared to 2001 (79%).

Cleaning and sanitation

There has been a significant increase in the use of commercial dishwashers (30% in 2001, 65% in 2007) and hot glass washers (16% in 2001, 24% in 2007) by food businesses since 2001. There was also an associated decrease in the use of domestic dishwashers (13% in 2001, 7% in 2007).

More businesses used chemical sanitisers for some or all of their equipment in 2007 (82%) compared to 2001 (76%).

Food recall plan and food safety programs

Of the 8% of food businesses surveyed who were required to have a written food recall plan (food businesses involved in the wholesale supply, manufacture or importation of food), 50% had a written food recall plan.

In 2007, 39% of all food businesses had a written food safety program, compared to 19% in 2001.

General assessment of the premises

Overall, in 2007, food businesses were considered to be clean (89%) and well maintained (92%), similar to 2001.

There were significant improvements to food businesses' premises since 2001 to the extent that in 2007 almost all businesses had adequate lighting (99%), adequate ventilation (97%), were free from pests (97%), stored chemicals safely (97%) and stored personal clothes appropriately (92%).

More businesses had a pest control program or contracted a pest control company in 2007 (83%) than in 2001 (76%).

Key findings for bakeries

In the Observational Survey, additional information sought from bakeries on the use and storage of eggs indicated that some bakeries were using cracked eggs. Also, information obtained on cleaning and sanitising piping bags indicated that some businesses were not effectively cleaning and sanitising reusable piping bags between uses. This was supported through the Telephone Survey finding of a lower level of knowledge among bakeries compared to other food businesses of the need for cleaning and sanitising piping bags between uses.

Key findings for sushi makers

In the Observational Survey, additional information sought from sushi makers indicated a small proportion did not store prepared rice or sushi at 5°C or lower and did not have a system to determine the amount of time the sushi had been on display at more than 5°C. However, all who stored rice or sushi out of refrigerated conditions of 5°C or less added vinegar (or other acidic substance to lower the pH to discourage the growth of food poisoning bacteria) to the rice as an alternative to refrigeration.

Differences between safe food handling knowledge and practice in food businesses

Generally, the level of food businesses' safe food handling knowledge exceeded the level of actual practice. However, there were some instances where safe food handling practices exceeded the level of knowledge. The proportion of businesses that knew the correct storage temperatures of chilled and hot foods was less than the proportion of businesses observed to follow the correct practice. Similarly, the proportion of businesses that knew the correct times and temperatures for cooling cooked food was less than the proportion of businesses observed to be carrying out this practice correctly. This indicates that, while knowledge in some food safety areas may be lacking, businesses may have processes and procedures in place that ensure that safe food handling practices take place.

Differences between different business demographics

In general, better food safety knowledge and practices were identified in high risk businesses, large businesses, businesses with a food safety program, businesses that provide food safety training to their staff and businesses where English was the main language spoken.

What happens next?

FSANZ is currently analysing the results of the survey to assess the differences in the safe food handling knowledge and practices of food businesses under each key food safety area, before and after the introduction of the National Food Safety Standards. It will also identify any areas where efforts could focus on increasing awareness of the Food Safety Standards and where compliance activities could further improve safe food handling knowledge and practices among Australian food businesses.

Copies of the executive summary and full report are now available on the FSANZ website at [\[web link\]](#). For further information please contact Christina Belperio by phone (+61 2 6271 2222) or email (christina.belperio@foodstandards.gov.au).