



CAMPBELL RESEARCH & CONSULTING

Evaluation of Safe Food Practices

Raising the Standards

Prepared for

The Australasian Evaluation Society

By Campbell Research & Consulting with Support from Food Standards Australia New Zealand and the Food Safety and Regulatory Activities Unit, Victoria

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1. Introduction

This paper describes work conducted by Campbell Research & Consulting for two related projects in the food safety and regulation sector.

The first project was conducted for Food Standards Australia New Zealand (FSANZ) and comprised a two-part survey of food businesses across Australia. The two surveys were used to evaluate the impact of changes to food safety regulation on the knowledge and practice of food business staff. The survey comprised two components: a telephone survey of food businesses to assess *knowledge*, and an observational survey to assess *practice*. The first two-part survey was conducted in 2001 the second in 2007.

The second project was commissioned by the Department of Human Services Food Safety and Regulatory Activities Unit (FSRA), Victoria. FSRA conducted additional surveys using the CR&C design in the years between the two national surveys. However, the data from those surveys had not been fully integrated to give an account of change over time, or the way in which changes in knowledge related to change in practice. CR&C worked with FSRA to compile the data from the Victorian surveys to assess these changes.

While the use of pre/post and time-series designs may sound simple, many challenges and obstacles needed to be overcome to successfully deliver on each of these projects. This paper describes the many considerations that were required for the projects, the findings from each study.

1.1 Context

Food borne illness impacts on the wellbeing of both Australians and the Australian economy – a recent study estimated that the total cost to the community of food borne illness in Australia is around \$1.2 billion per year.

In August 2000, the Australia New Zealand Food Standards Council agreed to the inclusion of three Food Safety Standards in the *Australia New Zealand Food Standards Code* (Standards 3.1.1, 3.2.2 and 3.2.3). The three Standards, developed by FSANZ, contain requirements relating to food safety practices, premises and equipment. The purpose of these new Standards was to allow consistent food safety regulations to be implemented across all States and Territories. The introduction of these standards aimed to reduce the incidence of food borne illness and associated costs to wellbeing and productivity in Australia.

State and Territory Governments introduced the new Food Safety Standards into their legislation between 2001 and 2003. The Standards included requirements for food businesses in relation to:

- The skills and knowledge of food handlers and their supervisors;
- Specific food handling controls for certain steps in the production chain;
- Having a system to recall unsafe food;
- The health and hygiene of food handlers;
- The cleaning, sanitation and maintenance of equipment and the premises; and
- The suitability of the food premises and equipment.

In addition to implementing the three compulsory Food Safety Standards, Victoria introduced compulsory Food Safety Programs for high risk food premises. Victoria introduced compulsory Food Safety Programs in March 1999 for high risk food premises.

1.2 Timeline

In its simplest form, the evaluation consisted of two surveys, both commissioned by FSANZ: one that took place in the very early stages of the introduction of the three standards, and a second survey after the standards were introduced. During this time, FSRA conducted an additional three surveys in Victoria

The new standards were introduced in 2001, the same time that FSANZ commissioned the benchmark survey. The standards were rolled out over the next two years across each state and territory. In 2006, FSANZ commissioned the second follow up survey, approximately four years after the standards had been fully introduced. Additional state-based surveys were commissioned by FSRA during this time in 2002, 2004 and 2006.

2. Methodology

The surveys were based on two key evaluation questions:

- Had the introduction of the new standards led to an increase in knowledge of safe food handling practices amongst food businesses?
- Was this increase in knowledge translated into changed practice, presumably leading to a reduction in the incidence in food borne illness?

Accordingly, two surveys were designed to assess each of these dimensions.

The first was a telephone survey of food businesses to assess *knowledge* of safe food handling practices. The knowledge-based questions covered all aspects of safe [food handling](#) practice from delivery, to storage, preparation, serving and sanitation. A key consideration in the design of this survey was to avoid social desirability bias. Each question was carefully worded to avoid reference to the practice of the individual or the business, that is: what the business *should* do to the knowledge of the staff member, as opposed to what they *do* do. 2,300 businesses were surveyed.

The second survey used observational techniques to assess *practice* within food businesses. CR&C harnessed the knowledge of Environmental Health Officers (EHOs) to enumerate the survey. (EHOs are the professionals who are responsible for the inspection of food businesses under local governments across Australia). The key aim of this survey was to assess actual practice in the every day functioning of the business. Wherever possible, observation was used to assess practice, though some questioning of food business staff was required. 114 local councils were recruited and [916](#) businesses were observed.

A nearly identical approach was taken for the two-yearly Victorian studies, though the content of the surveys was altered to suit the Victorian context.

3. Challenges

The project as a whole faced two sets of challenges in relation to the structure of the food regulation system: one could be considered vertical in nature and the other horizontal.

3.1 Vertical challenges

The food regulation system contains many tiers, starting at the national level where standards and regulation are formed; the state-based health and food safety bodies where standards and regulations are interpreted and implemented; and the local government level where standards are enforced. Food businesses are expected to abide by the regulations at all levels, which in turn protect the consumer from food borne illness.

With the exception of the consumer level (this was a business survey) CR&C had to consider the needs and culture of each level of the system to successfully implement the survey. Specific issues at each level included:

➤ National level

Issue: A national survey requires a national sample; however no national database of food businesses exists. At the local level: lists of food businesses are maintained in various forms by local councils. However, complete lists of food businesses are not maintained at the state level. Some state governments have attempted to implement databases of food businesses based on lists maintained by local councils. At the time of the evaluation, no state government had successfully created comprehensive lists. As such, no national database of food businesses was available for the survey¹.

Resolution: CR&C was able to source a commercial product that could be used: a database containing a relatively comprehensive list of food businesses that had been compiled by a private company. While not ideal or comprehensive, this product was deemed to be of sufficient quality for use in the survey.

➤ State level

Issue: In recognition of the importance of the project, funding for the follow up national survey was contributed by all State and Territory health/food authorities as well as by FSANZ (national). State and Territory contributions were proportional, depending on their population. CR&C proposed to over-sample food businesses in the smaller states and territories to be able to generate sufficient sub-samples to make reliable estimates for each state and territory. However, there was a view that sampling should also be in proportion to population and funding. Thus a tension arose between methodological and political/financial considerations.

Resolution: Careful explanation and diplomacy was required to promote the benefits of over-sampling and the value that would be obtained from a sampling structure that did not exactly mirror the funding allocation and population in each state, that is, a nationally consistent survey allowing rigorous comparisons at the national and state/territory level. This process was facilitated by the establishment of a project team at the

¹ The Electronic Yellow Pages has historically been used as a sample pool for this type of survey. However, the Electronic Yellow Pages has not been updated for many years and was deemed unsuitable for use.

commencement of the project, with representation from a range of interested jurisdictions, which was involved in all stages of survey planning and administration.

➤ **Local government level**

Issue: EHOs are typically time-poor, and the conduct of the observations was relatively time-consuming exercise. Further, not all EHOs saw the value of the national survey.

Resolution: While many EHOs kindly volunteered their time, gentle persuasion was required for others. A great deal of follow-up was also required for many EHOs. CR&C is providing individualised reports to each participating council. These tailored reports give a snap-shot of practice for each council which will be of more relevance than the state-wide or national picture. These localised reports will also provide a comparison to the state average so that councils may benchmark their performance.

➤ **Food Business level**

Issue: Food business staff are often very hard to contact for surveys. Food businesses generally work to strict timetables. Factories work in set shifts; restaurants have the dinner period and the lunch period and so forth. There was also a need to balance the conflicting requirements for scheduling observational surveys during periods of activity so that food handling practices could actually be observed, while trying to minimise the disruption and impost on the food business.

Resolution: Careful scheduling was required for both surveys. The telephone survey required an automated system of call times depending on the business and the time of day. The interviewing system was designed to prevent calls to restaurants during busy hours, and to factories outside of shift hours etc. In relation to the observation of practice: EHOs were instructed to make up to three attempts for each business to make sure the timing of the survey was suitable.

3.2 Horizontal

The horizontal structure of the food regulation industry is as ‘tall’ as it is ‘wide’. Challenges were also faced on the horizontal axis.

Issue: Food businesses are diverse, with many types of organisation producing or serving food to the public. The operation of a hospital kitchen is very different to that of a grocery store or a factory. Just as the food regulation system faces a challenge in the production of standards to cover all contingencies, the survey of food businesses had to produce a questionnaire that was sensible and meaningful for all food businesses.

Resolution: A modular design was required for the questionnaire with large banks of questions specifically designed for different food business types. Further, a large ‘demographic’ section was required for the questionnaire to determine the type, size and nature of the food business. This demographic section occupied almost one third of the questionnaire overall.

4. Findings

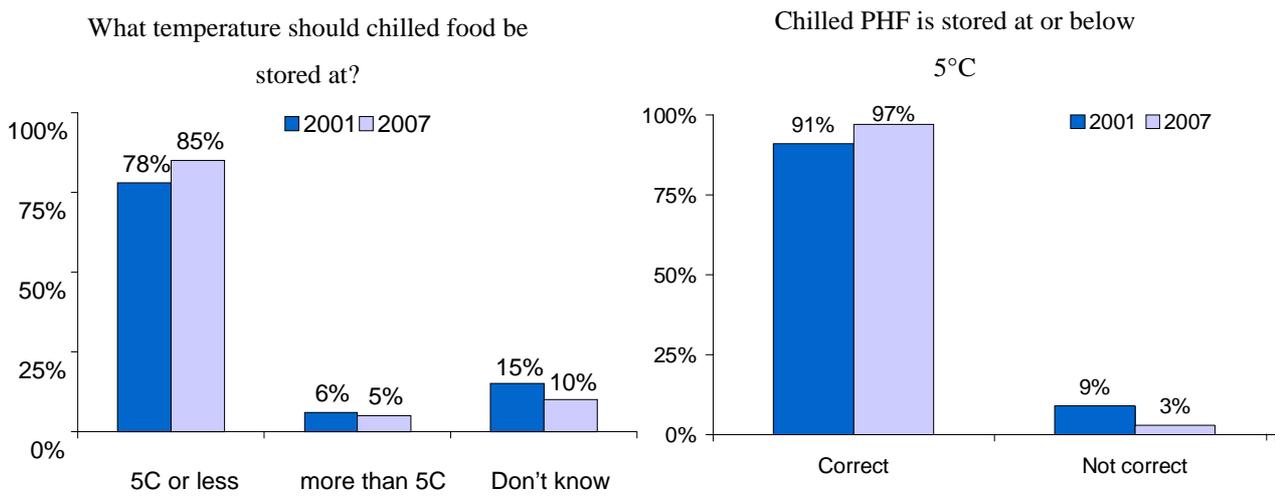
Both the national and state-based surveys showed an improvement in knowledge and practice. Where the national survey gave a long-term overall picture, the Victorian surveys allowed for a finer analysis of changes in knowledge and practice.

4.1 National findings

The national surveys showed consistent improvements in food safety knowledge and practice between 2001 and 2007. Some simplified examples of the findings are presented below.

4.1.1 Storage

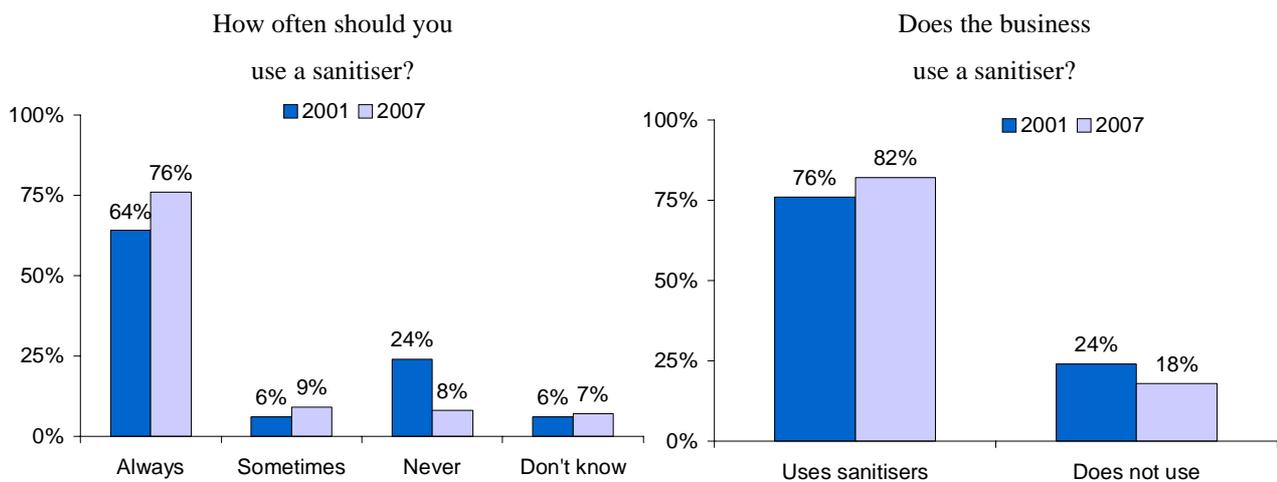
Knowledge of safe food storage temperatures increased from 78% demonstrating correct knowledge to 85% (refer to the chart on the left). Practice also improved from 91% demonstrating the correct practice to 97% (refer to the chart on the right).



4.1.2 Sanitation

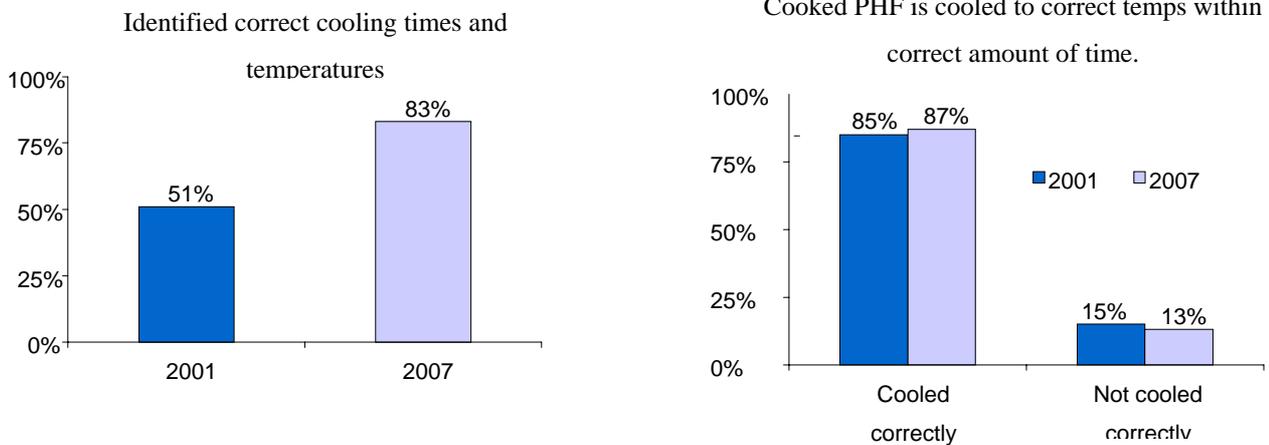
Knowledge of correct sanitation practices increased between 2001 and 2007. The proportion of food business staff giving incorrect answers about sanitation (that sanitisers should never be used) decreased substantially from 24% to 8% (refer to the chart on the left),

Similar improvements were seen for sanitising practice with a higher proportion of businesses using sanitisers in 2007 (refer to the chart on the right).



4.1.3 Preparation – cooking and cooling food

Knowledge of correct cooking and cooling temperatures improved dramatically from 51% to 83% (figure on the left). Practice showed a non-significant increase from 85% to 87% (figure on the right).



4.2 More detail over time: the Victorian study

As the Victorian studies had been conducted more frequently than the FSANZ study, CR&C was able to work with FSRA to compile a time-series analysis of change in food safety knowledge and practice. The specific focus of the time series was an evaluation of the impact of the introduction of the Food Safety Program requirement in Victoria. From 2002, all food businesses were required to register a Food Safety Program: a documented account of how the business maintained high standards of safe food handling practice.

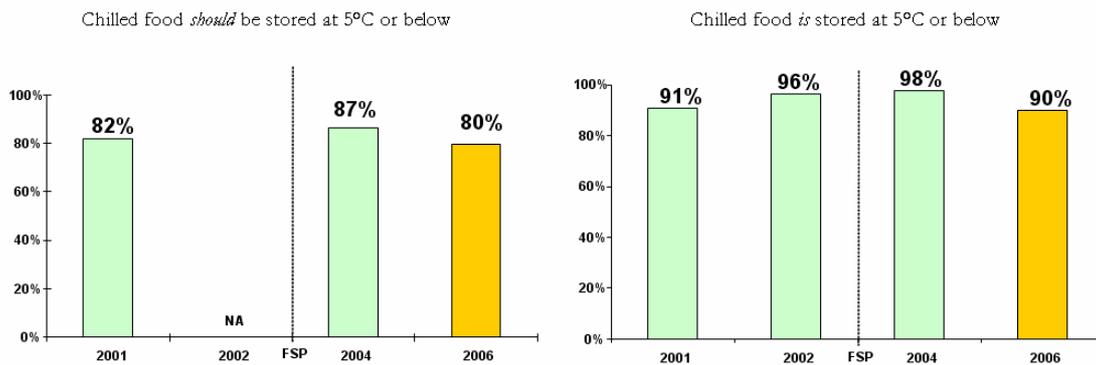
The time series analysis showed a form of halo effect. Knowledge and practice tended to build up during the lead-in to the introduction of Food Safety Programs. However a plateau of practice and sometimes knowledge was seen directly after the



introduction of the requirement, with modest declines in practice and knowledge recorded thereafter. It could be assumed that the immediacy and visibility of the requirement boosted practice and knowledge at the time (the halo), but that that boost was not maintained for all areas of food safety. Some examples of this effect are provided below.

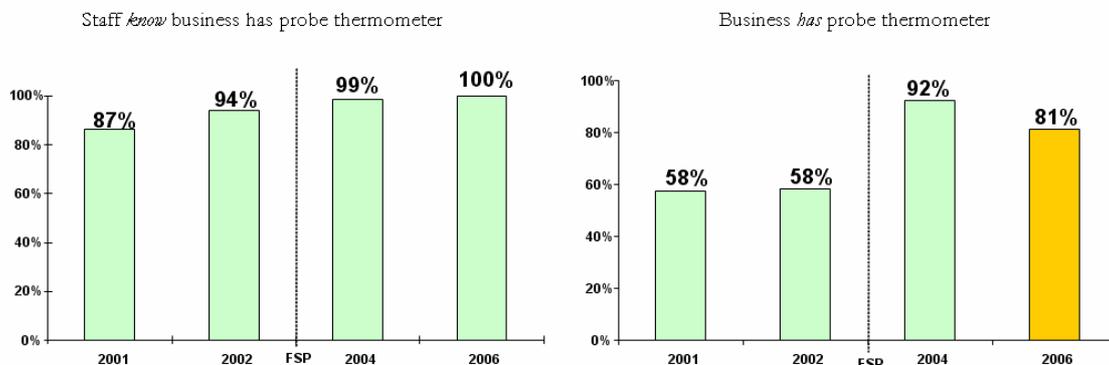
4.2.1 Chilled foods

Knowledge of safe food storage increased from 82% in 2001 to 87% 2004 (Food Safety Programs were introduced in 2002, however the question was not asked in 2002). However a decline was seen between 2004 and 2006. (Refer to the chart on the left). A similar plateau was seen for practice with a peak of 98% demonstrating correct practice in 2004, declining to 90% in 2006 (refer to the chart on the right).



4.2.2 Use of thermometers

Knowledge of the use of thermometers to check the temperature of food has gradually increased since 2001, peaking at complete knowledge (100%) in 2006 (refer to the chart on the left). However, the same trend was not apparent for practice. The presence of probe thermometers increased dramatically after the introduction of Food Safety Programs in 2004 to 92%. However, over the next two years this declined sharply to 81% (refer to the figure on the right).



5. Adding value

CR&C provided the Australian food regulation system with a research instrument that could be used across a broad range of food businesses and over long periods of time.

As an evaluation, the value of this project is recognised through the analysis of nationally consistent data that provides information back to all levels of the food regulatory system to ‘close the loop’ in a relevant and useful way.

The initial FSANZ these project represented what was possibly the first instance of national cooperation in food safety evaluation – the first time that an evaluation of a standard across all levels of food regulation has been completed: very successful, with the opportunity for identification and resolution of issues across all levels of govt in a holistic and consistent way.

This tool was designed at the national level, but was then taken on the state level and repeatedly on a regular basis by companies other than CR&C. After seven years, CR&C worked with our state-based client to compile the work done by these other companies into a single coherent dataset that elucidated patterns of food safety knowledge and practice over time.