NSW GOVERNMENT Food Authority

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Annual Food Testing Report

2013 - 2014

January 2015

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Contents

Introduction

The NSW Forensic & Analytical Science Service (NSW FASS) at Lidcombe has conducted the majority of food testing for the NSW Food Authority (the Food Authority) since the formation of the Food Authority in 2004. This included microbiological detection and enumeration, chemical analysis, identification of viruses and detection of genetically modified (GM) ingredients. At the conclusion of each financial year a report is prepared that documents the testing conducted by NSW FASS for the Food Authority.

As of October 2014, the food laboratories at NSW FASS ceased operations and the Food Authority engaged a subsequent laboratory to perform their testing. This report is the final Joint annual testing report between NSW FASS and the Food Authority[1] and will document testing conducted from July 2013 until October 2014. This report does not document testing conducted by other external laboratories.

Samples were submitted to the Food Microbiology and General Chemistry Laboratories, the Trace Inorganics Laboratory and Molecular Microbiology Laboratory and less frequently to the Water Microbiology Laboratory. Food products are sampled and tested for a variety of reasons. These include to:

- ensure compliance to regulatory requirements
- assist with any required enforcement action
- respond to any incidents that occur in the industry
- provide scientifically based industry communication, training and advice
- provide scientifically based consumer advice and community information
- assist with any local government concerns and complaints
- assist with the development of food regulatory framework
- assist with the evaluation and review of regulations
- assist with the development of emergency management framework.

A Service Level Agreement (SLA) between the Food Authority and NSW FASS outlined the tests available, test numbers, turnaround times and other logistics in regard to testing food samples.

The Food Laboratories at NSW FASS were NATA accredited and as part of their NATA accreditation, the laboratories were required to participate in proficiency testing programs to satisfy ISO/IEC 17025 requirements on assuring the quality of test results (Table 1).

[1] Samples submitted to NSW FASS under commercial arrangements are not included

Table 1. Number of proficiency trials undertaken during 2013–2014

Laboratory	Number of proficiency trials undertaken
Food Microbiology	8
Molecular Microbiology	2
General Chemistry	6

All of the results reported by the laboratory were within the program's acceptable statistical range for each of the test results.

Community activities

- The Food Microbiology Manager completed a year as a mentor in the Standards Australia Young Leaders Program.
- The Molecular Microbiology Manager was a technical assessor for the NATA accreditation of a laboratory in Western Australia.

A year in review

Between July 2013 and October 2014 NSW FASS conducted 24,051 tests on 3541 samples submitted for testing by the Food Authority under the SLA. Sample numbers and tests for the four main laboratories utilised by the Food Authority are outlined in Table 2. The diversity of foods analysed include raw and processed meats, raw and processed seafood, fruit and vegetables, soft serve, dairy products, and other processed foods. Samples submitted to NSW FASS for testing are classified into five main categories depending on the reason for testing. The number of samples for each category is outlined in Table 3.

Table 2: Sample and test numbers

Laboratory	Samples	Tests
Food & Molecular Microbiology[2]	2565	11467
General Chemistry	834	12,442
Trace Inorganics	142	142
Total	**3541**	**24,051**

Table 3: Number of samples submitted per category

Category	Samples			
	Food & Molecular Microbiology	General Chemistry	Trace Inorganics	Total
Compliance and enforcement	82	342	0	424
Foodborne illness investigation	827	27	0	854
Survey program	295	422	142	859
Verification programs	1327	18	0	1345
Proficiency and R&D	33	15	0	48
Miscellaneous[3]	1	10	0	11
Total	**2565**	**834**	**142**	**3541**

[2] For the Food Microbiology laboratory, weighted numbers of tests registered are used. The weighting factors are used to calculate microbiological test numbers where positive test results occur to reflect the actual workload. All negative tests are counted as one test only.
[3] includes samples submitted per council request

Surveys completed in 2013–2014

Artificial colours in confectionery (imported) and sauces

Over the years there has been considerable debate on the effect of artificial colours on children's behaviours.

Any substance that is added to a food or beverage that imparts or changes its colour is known as a food colouring. Food colourings are routinely added for many reasons such as:

- to offset colour loss due to exposure to light, air, temperature extremes, moisture and storage conditions
- to correct natural variations in colour
- to enhance colours that occur naturally
- to provide colour and identity to colourless and "fun" foods
- to protect flavours and vitamins from damage by light.

Food colouring has evolved over the past decade, with a growing number of natural colours commercially available. Consumers are increasingly making more informed choices with the food they eat.

From 2010 to 2013, the Food Authority conducted two surveys on artificial colours in foods in response to a number of public complaints and surveys by international organisations identifying potential use of non-approved colours.

A total of 426 samples comprising of 321 imported confectionery products and 105 sauces were collected throughout Sydney metropolitan and tested for a range of permitted and non-permitted artificial colours. Results were assessed against the Australian New Zealand Food Standards Code (the Code) *Standard 1.3.1* food additives.

The two surveys focused on fifteen permitted and non-permitted artificial colours. Standard 1.3.1 permits the use of twelve artificial colours at a maximum level of 290mg/kg (singly or in combination). There is also a special permission in the Code for amaranth (123) which is permitted in confectionery at a maximum level of 300mg/kg as a single colour or in combination. Two non-permitted colours, namely Sudan I and Erythrosine, were also tested because there was an issue with the use of Sudan I in the past. Also, even though Erythrosine is not permitted in Australia, it is permitted in other countries.

<u>Confectionary key findings:</u>

- Of the 321 samples, 270 (84.1%) complied with requirements in the Code. The main reason for non-compliance was the use of permitted artificial colours that were not declared in the ingredient list (n=32).
- 27 samples tested claimed '*no artificial colours*'; Four of these contained undeclared (but permitted) artificial colours.
- Six samples (1.8%) contained artificial colour above the maximum permitted level (generally 290 mg/kg except for amaranth which is 300 mg/kg).
- Twelve samples were found to contain levels of the red dye Erythrosine which is not permitted in Australia.
- The most commonly added artificial colour was Allura red. Allura red also had the highest maximum and mean concentrations of 819 mg/kg and 49.4 mg/kg respectively.
- Nine infringement notices were sent to importers during the first year of testing for various non-compliances. Retests were completed on four samples, all of which

complied with the Code. The remaining five samples were subsequently unavailable in NSW. During the third year of testing no samples from the previous year were found, this was due to the majority of samples appearing in show bags from the 2012 Royal Easter Show and not being sold in retail shops.

Sauces and pastes key findings:

- 92.3% (97/105) of samples tested complied with the Code.
- Six (5.7%) samples contained undeclared artificial colours. Follow up samples were collected by the Compliance, Enforcement and Investigation branch and retested after warning letters were issued.
- Four (3.8%) samples were found to exceed the maximum level of artificial colours (290mg/kg) singly or in combination. The highest level of combined permitted artificial colours was detected at 5625 mg/kg followed by 1831 mg/kg, 1153 mg/kg and 386 mg/kg. Two of these samples also failed to declare artificial colours on the label.
- Enforcement officers contacted two NSW manufacturers and two Australian importers to issue infringement notices and provide corrective actions for non compliant samples. Non-compliant samples were then retested with one importer and manufacture complying with the Code with the other parties either ceasing production or discontinuing their products into Australia.

Overall, the compliance rate for imported confectionery was 84.1% and 92% for sauces and pastes.

It should be noted that even though some of the samples found in this survey did not comply with the Code, they are not considered as unsafe. Products that were found to contain non-permitted artificial colours or exceeding the maximum level of colours, posed little health risk to the average population because consumption would not be a daily occurrence. The acceptable daily intakes (ADI) of each artificial colour have been developed to ensure a large safety margin is factored in to provide a safety factor should health standards be compromised. The population most at risk are children aged between 2-5 years old, due to their low body weight and age.

The importers of all non-compliant samples were contacted as part of the Food Authority's food importer project and asked to rectify the breaches or face possible prosecution under the Food Act.

The survey highlights the need for manufacturers and importers to scrutinise their product formulations carefully and ensure that labels are updated when product formulations are changed. Importers should not assume that international manufacturers are aware of food regulatory requirements of different countries. Therefore importers must be aware of any changes to the formulations of products they import.

The full report can be found at:
http://www.foodauthority.nsw.gov.au/_Documents/science/artificial_colours.pdf

Microbiological quality of soft serve and frozen yoghurt

Soft serve and frozen yoghurt are congealed dairy products produced by freezing a heat treated mixture of milk, cream, milk solids, sugars, stabilisers, emulsifiers and flavourings. Soft serve differs from hard ice cream in that the premix is distributed in powdered or liquid form and the final product is formed at retail. Pre-mixed product is introduced to the storage chamber of the machine where it is kept at 3°C. When product is drawn from the draw valve, fresh mix combined with the targeted quantity of air is introduced to the freezing chamber either by gravity or pump. It is then churned and frozen quickly and stored until required (Arbuckle, 1986).

In NSW, under the NSW Food Regulation 2010, producers of dairy products, including manufacturers of ice cream and soft serve pre-mix are required to be licensed with the NSW Food Authority (the Authority). Retail businesses selling soft serve, such as fast food outlets, independent retailers and mobile outlets are inspected by local councils.

To gather up to date information, the NSW Food Authority in conjunction with twenty one NSW local governments (councils) conducted a survey of soft serve and frozen yoghurt. The aims of the survey were:

- To assess the microbiological quality of soft serve and frozen yoghurt sold in NSW,
- To gather information on the common handling practices in retail businesses that sell these products (eg cleaning and sanitation practices of the dispensing machines), and
- To assist local council officers in providing food safety education and advice to retailers that sells these products.

From November 2012 to February 2014, 153 soft serve and frozen yoghurt samples were collected during unannounced visits to 99 businesses that sell these products across NSW. When compared with the NSW Food Authority's *Microbiological quality guide for ready-to-eat foods*, 88.2% of samples were classified good or acceptable. The remainder was categorised as unsatisfactory due to an elevated standard plate count (SPC). No sample was positive for *E. coli*, *Salmonella* or *Listeria monocytogenes*.

The survey highlighted the need for improvement in cleaning and sanitation of dispensing machines. Up to 50% of businesses that used sanitiser did not use it appropriately. The NSW Food Authority has published a *Cleaning and sanitising in food businesses factsheet* that can help businesses address this issue.

The full report can be found at www.foodauthority.nsw.gov/au/science/market-analysis

Survey on microbiological quality and chemical composition of some plant products excluded from the NSW Food Safety Scheme

In 2005, the Plant Products Food Safety Scheme was introduced into legislation. The Scheme required businesses (with the exception of retail businesses) handling certain plant products to be licensed and operate under a food safety program. The products covered by the Scheme include fresh-cut fruits and vegetables, vegetables (or fruits) in oil, unpasteurised juices and seed sprouts. These products were included in the scheme based on a report by Food Science Australia (2000) which identified them as high risk.

Since then other plant-based product groups have increased their presence in the market such as soy products, fermented vegetables, vegetable-based dips & sauces, mixed salads, and fresh cut vegetables excluded in the plant products scheme (for example fresh herbs).

As little information was available on the current microbiological status of these products, a survey was carried out to assess the microbiological quality and/or chemical properties of those products.

301 samples of tofu, mixed salads and vegetable based dips & sauces were tested for a range of bacteria and compared against the Authority's *microbiological guide for ready to eat food*. 96.7% of products tested were of a good or acceptable microbiological standard

A total of 10 samples (3.3%) were classified unsatisfactory due to an elevated level of *B. cereus,* CPS and/or *E. coli*.

- Three tofu samples were found to be unsatisfactory due to elevated level of coagulase positive staphylococci, *Bacillus cereus*, and *E. coli*. Another sample was also unsatisfactory due to very low level of *Salmonella* (only positive by PCR and not by cultural method). *B. cereus* is known to be present on soybeans and its heat resistant spores can germinate in the products. *E. coli* and *S. aureus* can be present in tofu due to its high protein content and the amount of handling subsequent to the heating process. However, correct refrigeration will inhibit the growth of these organisms.
- Three mixed salad samples were found to be unsatisfactory due to presence of *B. cereus.* This is not unexpected due to the presence of raw vegetables. *B. cereus* is present in soil and may contaminate vegetables used in the salad. The pH limit for growth of *B. cereus* is 5.0 under ideal conditions (ICMSF, 1996). One product had a pH of 4.4, thus it is expected that no growth would occur. The other two products had a pH of 5.0 and 5.2. However, the refrigerated storage of these products also means that growth is unlikely as reductions in storage temperature below the optimum will increase the minimum pH value for growth.
- Three vegetable-based dips and sauces tested in this survey were found to be unsatisfactory due to elevated level of *B. cereus* and *E. coli*. The unsatisfactory samples were hommus topped with paprika, hommus, and beetroot dip (containing tahini and chickpeas). These products have high water activity, high nutrient content and relatively neutral pH, which make for a favourable microbial media. However, the growth may be inhibited by presence of acids and refrigeration.

Bunched fresh herbs (103 samples) were also tested and were acceptable when compared to UK guidelines and EU regulation. Chopped fresh herbs, other than in mixed salads, were not found in the market place and were not included in the survey.

The survey illustrated that the plant products tested were, in general, of a good or acceptable microbiological standard. The survey supported the finding of the CSIRO scoping study and literature review that these products are generally of lower risk when compared to those covered by the Scheme.

The full report can be found at:
http://www.foodauthority.nsw.gov.au/_Documents/science/Background_info_plant_products_not_regulated.pdf

Surveys continuing into 2014–2015

- Trans fatty acid (national survey)
- Microbiological quality and preservative use in fresh noodles sold in NSW
- Microbiological quality of deep fried ice cream
- Hot bread shop survey in conjunction with local councils

Microbiological Verification Program

The microbiological verification program monitors food produced under Food Safety Schemes (the Scheme). Products manufactured or packaged in NSW under the Scheme were purchased direct from the manufacturer and tested against requirements as set out in the Scheme or prescribed in the Code. This may include microbiological testing and/or chemical analysis. When a sample was found to be noncompliant, the manufacturer was inspected by an officer from the Audit Systems and Verification Team.

From July 2013 to October 2014, 603 samples[4] were randomly purchased and submitted for microbiological or chemical testing. Product types and number of samples are outlined in Table 4.

Table 4: Number of samples analysed under for the microbiological verification program

Scheme	Product category	No. of samples	No. of noncompliant samples
Meat	Smallgoods/RTE meats	221	7
Dairy	Cheese	91	7
	Cream/butter	7	
	Desserts/dips	17	1
	Ice cream/gelato	99	
	Milk (including goats milk)	11	
	yoghurt	10	
Plant products	Fresh cut fruit/veg	40	
	Seed sprouts	26	1
	unpasteurised juice	6	
Seafood	Oysters (opened or bottled)	22	1
	RTE seafood	53	1
Total		**603**	**18**

A surveillance program for egg farms and eggs grading facilities was also introduced in July 2013 to gather information on the prevalence of *Salmonella* on these premises after the introduction of regulatory requirements[5]. Results will be compared to baseline data for assessing future impacts of the egg regulation and for monitoring any changes to composition and activities of the NSW egg industry. As part of this 461 environmental and egg samples were taken between July 2013 and October 2014. Data collection is continuing.

[4] The number of verification program samples listed in table 3 is different than that in table 4 as table 3 includes samples as part of the egg verification program and listeria environmental testing program.
[5] The Egg Food Safety Scheme was introduced in NSW in June 2010

Food complaints and audit investigations

The Food Authority investigates complaints received through the Consumer and Industry Helpline (Helpline) or issues identified by the Authorised Officers. These investigations can result in the analysis of food for a wide variety of tests. In addition, food safety officers may also collect food samples during an audit or inspection if they suspect the business is non-compliant with the Code.

Between July 2013 and October 2014, 424 samples were submitted to NSW FASS for testing due to complaints or investigations.

Table 5 provides details of the more common analyses requested. Investigation and/or enforcement action was instigated for non-compliant samples. Common products tested during the year include mince meat and sausages.

Table 5: Food complaint and audit investigation samples[6]

Analysis	Samples
Allergens	4
Microbiology quality	60
Artificial colours	21
pH	6
Meat speciation	15
Starch	19
Sulphur dioxide (SO_2)	258

SO_2 and meat species in sausages

The Code permits the use of the preservative sulphur dioxide (SO_2) in sausages to a maximum of 500 mg/kg. Mince meat however is not permitted to contain SO_2. To assess compliance 25 samples of mince meat and 178 samples of sausages were collected from 56 randomly selected butchers across the Sydney metropolitan area. Samples were tested for SO_2 and meat speciation. No mince sample contained SO_2 however two samples of mince labelled as beef contained pork.

A total of 15% of sausage samples contained SO_2 at levels greater than permitted by the Code. In addition, 27% of sausages samples were incorrectly labelled in regards to meat type. The majority of non-compliant sausages contained pork when they were labelled as another type of singular meat e.g. beef sausages contained beef and pork.

Field testing and sampling occurs routinely during audits and inspections of butchers

[6] Samples might be tested for more than one analysis

Foodborne illness investigations

The Food Authority investigates foodborne illness in partnership with NSW Health, local councils, and interstate agencies. Between July 2013 and October 2014 a total of 854 food and environmental samples were submitted for testing in response to a foodborne illness investigation and its follow up activities.

In addition, 313 samples were taken as part of the listeria environmental testing program conducted by the Food Incident Response and Complaints Team.

This year there was a large increase in the number of Salmonella outbreaks investigated by the Food Authority, with 14 in total and half of these linked to raw egg foods. Three of the outbreaks involving raw egg foods occurred at hot bread shops serving pork and salad rolls. Other *Salmonella* outbreaks investigated were linked to cross contamination or other hygiene issues.

In response to these types of outbreaks, the Food Authority continued to work with local councils with high numbers of Asian hot bread shops and restaurants producing other high risk foods, including fried ice cream. Local businesses in these areas participated in microbiological sampling and educational programs to increase skills and knowledge, and reduce the risk of further outbreaks.

Also of note was a haemorrhagic *E. coli* outbreak affecting 5 people who visited a kebab shop in January 2014. Numerous food safety breaches were found during the investigation and the premises was closed until these were rectified. Despite extensive sampling no *E. coli* was detected in any food or environmental swabbing.

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