ANNUAL FOOD TESTING REPORT 2019-2020

NSW GOVERNMENT Food Authority

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Contents

Introduction

The NSW Food Authority's (the Food Authority) primary objective is to provide consumers in NSW with safe and correctly labelled food.

To support this objective the Food Authority regularly conducts testing of food products to ensure compliance with regulatory requirements, as part of foodborne illness investigations and to gather information to identify and respond to food safety issues. The Food Authority also undertakes scientific surveillance projects to identify and better understand food safety issues and risks in NSW. The data obtained in these surveillance projects allows the Food Authority to identify and respond to key food safety issues and develop systems and processes to manage the prevention of foodborne illness effectively and maintain food safety.

BVAQ, formerly DTS Food Assurance (DTS), is the primary testing provider for the Food Authority. Testing services provided by BVAQ include microbiological, chemical, foreign object identification, allergen contamination and nutritional composition. BVAQ has had accreditation from the National Association of Testing Authorities (NATA) since 1961.

At the end of each financial year, the Food Authority reports on the testing conducted by the Food Authority's primary testing provider and by other laboratories. Other laboratories used in 2019-2020 included Symbio Laboratories for biotoxin analyses, Elizabeth Macarthur Agricultural Institute for microbiological analyses and NSW Health Pathology for whole genome sequencing and serotyping.

Why test?

Samples are submitted for testing for reasons such as hygiene assessment, foodborne illness investigation, verification of food safety programs and for research purposes. Testing results are then used to:

- Ensure compliance to regulatory requirements
- Assist with the development of food regulatory framework
- Assist with the evaluation and review of regulations
- Assist with enforcement actions
- Respond to incidents that occur in the industry
- Provide scientifically based industry communication, training and advice
- Provide scientifically based consumer advice and information
- Assist local government with any concerns and complaints
- Assist with the development of emergency management framework

A year in review

Between July 2019 and June 2020, a total of 4,540 samples were submitted for testing: 3,633 samples to BVAQ where 10,376 individual tests were conducted and 907 samples to other laboratories where 2,678 individual tests were conducted (table 1). The number of samples was lower during this period as a result of restriction of movement due to the COVID-19 pandemic. Sample types analysed included meat, seafood, dairy, plant products, packaged food, eggs, food from retail outlets and environmental samples (e.g. swabs). Many samples were submitted for multiple tests which may have included both chemical profiling and microbiological assessment. Over 70 different types of tests were performed including microbiological assessment, chemical assessment, pH, water activity and allergens.

Table 1. Number of samples per category

Category	Number of samples
Verification programs	663
Research and targeted surveillance projects	255
Food safety compliance	3,622
Total	**4,540**

Verification programs

Food Safety Schemes verification program for ready-to-eat (RTE) products

The Food Safety Schemes verification program monitors RTE food that is produced under NSW Food Safety Schemes (the Schemes). Samples collected as part of this program include dairy, meat, eggs, plant products and seafood. RTE foods that were manufactured or packaged under the Schemes were purchased directly from the manufacturer or from retail outlets and tested against the requirements set out in the Food Safety Schemes Manual.

Between July 2019 and June 2020, a total of 87 samples were randomly collected from 43 businesses or retailers and submitted for testing (Table 2). This number of samples is lower than in previous years as sampling was suspended due to COVID-19 movement restrictions and unable to re-commence.

All products analysed were found to be compliant.

Table 2. Number of samples analysed for the Food Safety Schemes verification program

Scheme	No. of samples tested	No. of non-compliant samples (%)
Dairy	46	0 (0%)
Meat	29	0 (0%)
Plant products	7	0 (0%)
Seafood	5	0 (0%)
Total	**87**	**0 (0%)**

Raw poultry verification program

The raw poultry verification program gathers ongoing data on the prevalence and levels of *Campylobacter* and *Salmonella* in raw poultry so that any changes over time can be monitored and the effect of Standard 4.2.2 can be analysed.

Samples of raw poultry were collected from processing facilities and retailers in NSW and tested for *Campylobacter* and *Salmonella*.

Between July 2019 and June 2020, a total of 224 whole chickens and chicken portions were collected from processing plants and 164 chicken portions were collected from retail outlets. Sampling for this program was suspended due to COVID-19 movement restrictions and unable to re-commence.

At the processing plants, *Salmonella* was detected in 10.7% of samples (0.4% of samples had quantifiable levels of *Salmonella*) and *Campylobacter* was detected in 83.0% of samples (4.9% of samples had quantifiable levels of *Campylobacter*). At retail, 25.0% of samples tested positive for Salmonella (no samples had quantifiable levels of *Salmonella*) and *Campylobacter* was detected in 89.6% of samples (8.5% of samples had quantifiable levels of *Campylobacter*). NOTE: The limit of quantification for *Campylobacter* is 10 cfu/cm^2 for chicken portions and 5,000 cfu/carcase for whole chickens. The limit of quantification for *Salmonella* is 13 MPN/100cm^2 for chicken portions and 65 MPN/carcase for whole chickens.

Kilojoule menu labelling verification program

Food labelling regulation in NSW requires specific take away and fast food businesses to label the kilojoule information of standard menu items at the point of sale. This requirement is in response to increased consumer demand for information and part of the NSW Government's broad set of responses to tackle obesity. This regulation applies to 'standard food outlets' (retail businesses that sell standard food items) with 20 or more outlets in NSW or 50 or more outlets nationally.

The Food Authority's Kilojoule menu labelling verification program compares the declared value to the actual energy value from testing to ensure that companies remain diligent about the accuracy of their labelling. Each year, approximately 5% of the standard menu items from each chain are tested.

Between September 2019 and March 2020, a total of 147 food products from 46 chains were tested, which represents 82% of chains captured by the Regulation in 2019. Sampling for this program was suspended due to COVID-19 pandemic movement restriction and unable to re-commence.

During the initial testing, 44 products (30%) tested had significant kilojoule content discrepancy - 32 products (22%) from 22 chains had a kilojoule content discrepancy of more than 20% but less than 50%, while 12 products (8%) from 9 chains had a kilojoule content discrepancy of more than 50%.

Where variation between the analysis and published information was greater than 20% but less than 50%, two further samples were collected from two different locations. The average of the three results was then calculated and compared with the labelled value. This helped to account for the variation in handling practices at different outlets and seasonality. If the difference between the declared and analytical energy value was still greater than 20%, the company's head office was contacted to investigate. After repeat sampling and taking the average of the three samples from the three different outlets, 13 samples (9% from the original sample size) from eight chains still had a discrepancy of more than 20%. Five of these products had a lower energy content than labelled and eight products had a higher energy content than labelled. The head office was asked to investigate the issue and provide feedback to the Food Authority.

Where variation between the analysis and published information was greater than 50%, warning letters were issued and sent to the head office and the outlet so that the issue could be investigated and rectified. Nine warning letters were issued.

Some of the contributing issues that were identified include products not being made according to the recipe, incorrect calculation of the kilojoule content of the product and displaying the incorrect label. Corrective action taken include improving training for making the product to the recipe, reviewing of current kJ values in order to identify any errors and conducting audits of the outlets.

Research and targeted projects

The Food Authority conducts a number of research projects each year. The aim of these projects is to gather data to inform the Food Authority's future risk assessment work.

Plant-based alternative products survey

The market for plant-based products as alternatives to animal products (e.g. meat) has increased over recent years. Information on the microflora of plant-based alternative products that mimic meat is not widely available in the scientific literature. Reports available mainly focus on the nutritional aspects or consumers' acceptance. Therefore, a survey was carried out to gather information on the microbiological safety of these products and their labelling compliance with the Australia New Zealand Food Standards Code (the Code).

From February to July 2020, a total of 85 plant-based alternative products were tested for a range of microorganisms, pH and water activity. Testing results show that there was no microbiological safety concern with the products included in this survey. In addition, approximately half of the products had compliant labels according to the Code. The most common non-compliance was observed with nutritional claims where the manufacturer used non-permitted or unsubstantiated claims. Follow-up action was taken accordingly.

The survey report is being finalised and will be available on the Food Authority's website.

Campylobacter attribution study

The National *Campylobacter* attribution survey brought together *Campylobacter* isolates collected from humans, animals, and food sources in four states across Australia: NSW, ACT, Queensland and Victoria. Samples from food and animal sources were collected, tested for *Campylobacter*, and if positive, forwarded for whole genome sequencing to improve understanding of the source of the *Campylobacter* and the relationship between food, human and animal isolates. In NSW, 611 food samples were collected.

To date, four papers have been published from this project:

Moffatt CRM, Fearnley E, Bell R, et al. (2020). Characteristics of *Campylobacter* Gastroenteritis Outbreaks in Australia, 2001 to 2016. *Foodborne Pathogens and Disease,* 17(5):308-315.

Varrone L, Stafford RJ, Lilly K, et al. (2018). Investigating locally relevant risk factors for *Campylobacter* infection in Australia: protocol for a case–control study and genomic analysis. *BMJ Open*. 8:e026630.

Varrone L, Glass K, Stafford RJ, et al. (2020). Validation of questions designed for investigation of gastroenteritis. *Food Control*, 108:106871.

Walker LJ, Wallace RL, Smith JJ, et al. (2019). Prevalence of *Campylobacter coli* and *Campylobacter jejuni* in Retail Chicken, Beef, Lamb, and Pork Products in Three Australian States. *Journal of Food Protection*, 82(12):2126-2134.

Campylobacter 2018-19 retail survey

Campylobacter is a leading cause of foodborne illness in Australia and world-wide. The 'NSW Government Food Safety Strategy 2015-2021' describes a goal of reducing foodborne illness caused by *Salmonella*, *Campylobacter*, *Listeria* and allergen contamination by 30%. During 2018-19 an on-site survey of retail food businesses was undertaken by authorised officers from local councils in an attempt to explore if and how *Campylobacter* is transferred from raw chicken and liver to ready-to-eat products. A summary of the survey's findings were included in the 2018-2019 Annual Food Testing Report available here https://www.foodauthority.nsw.gov.au/sites/default/files/2020-08/annual_food_testing_report_2018_2019_1.pdf

During 2019-2020 the final report was completed and circulated to NSW local government partners. A summary report version of the project will be available on the Food Authority website before the end of 2020. One of the recommendations from the project was to promote the continuous need for vigilance on cleaning and sanitising, skills and knowledge and potential for cross-contamination, by both authorised officers and food handlers. Training topics delivered by the Food Authority to local government authorised officers will continue to highlight this.

Algal biotoxins in wild harvest shellfish

Algae (phytoplankton) are microscopic organisms that are the primary producers at the base of the food chain in almost all aquatic ecosystems. Some algae produce toxic compounds that can accumulate in filter-feeding bivalve shellfish and can be harmful to humans, if consumed. Sampling for potentially harmful algal species occurs weekly when wild harvest beaches are open for collection of pipis by commercial operators. Pipi flesh samples for biotoxin testing are collected only when potentially harmful species are detected. This process has limited the data available to inform a risk assessment.

The Food Authority undertook a biotoxin survey of wild harvest shellfish in the marketplace. The survey took place during the 2015, 2016 and 2017 wild harvest seasons. The results of the market survey found that 99% of samples tested were below the regulatory limit. When toxin was detected, the predominant toxin group was diarrhetic shellfish toxins (DSTs) (34.06 % of 323 samples were positive). Pipis were the main shellfish group sampled and DSTs were detected only in pipis (40.6 %, 110 of 271 samples). The survey was published (*Diarrhetic Shellfish Toxin Monitoring in Commercial Wild Harvest Bivalve Shellfish in New South Wales, Australia*) in a peer reviewed journal, available online (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6266617/).

In order to gain more data to develop a risk assessment, the survey was extended to the 2018 and 2019 wild harvest seasons. This survey is now complete, and a separate report will be prepared. A summary of results from samples collected during the 2018-19 and 2019-20 financial years is provided in Table 3. During the 2019-2020 period, 37 shellfish samples were tested for algal toxins. Of these, two cockle samples were positive for amnesic shellfish toxins. The positive results were 2.4 and 4.8 mg/kg domoic acid (regulatory limit 20 mg/kg domoic acid). One (bait only) cockle sample was also positive for gymnodimne (0.044 mg/kg). While this sample was not from a batch of shellfish intended for human consumption, it should be noted that this toxin is not regulated in shellfish and has not been linked to human illness cases. In addition, ten pipi samples were positive for diarrhetic shellfish toxins (DSTs). The positive results in pipi samples ranged from 0.054 - 0.54 mg/kg okadaic acid equivalent (regulatory limit 0.2 mg/kg okadaic acid equivalent). During the 2019-2020 sampling period, thirteen of 37 samples returned positive toxin results and, of these, three results were above the regulatory limit (DSTs only). All three results above the regulatory limit for DSTs were from the same collection beach and from stock harvest within a two day period. The beach was closed to harvest upon receipt of the high results.

Table 3. Summary of shellfish samples and results for wild harvest market survey samples collected during the 2018 and 2019 wild harvest seasons

Shellfish type	2018/19	Toxin detected	2019/20	Toxin detected
Pipis	70	Yes - 13*	29	Yes - 10#
Cockles	5	No	5&	Yes - 3^&
Clams	1	No	3	No
Total	76	13/76	37	13/37

*Diarrhetic shellfish toxins, maximum 0.18 mg/kg okadaic acid equivalent (regulatory limit 0.2 mg/kg okadaic acid equivalent).

#Diarrhetic shellfish toxins, maximum 0.52 mg/kg okadaic acid equivalent (regulatory limit 0.2 mg/kg okadaic acid equivalent).

^Amnesic shellfish toxins were reported in two cockle samples, maximum 4.8 mg/kg domoic acid (regulatory limit, 20 mg/kg domoic acid).

&Two samples of cockles were bait only, i.e. not for human consumption. One of these samples had a low level positive result for gymnodimne (0.044 mg/kg). There are no known reports of human illness related to this toxin, and this toxin is currently not regulated in shellfish.

Projects continuing into the 2020-2021 financial year

There are no projects continuing into 2020-2021.

Food safety compliance

Food safety compliance activities include:

- Conducting audits and inspections of food businesses
- Investigating breaches in compliance to the Code
- Investigating suspected foodborne illness
- Investigating labelling complaints and compliance
- Addressing issues identified by Food Safety Officers during audits
- Targeted food business or sector projects to increase compliance

These investigations can result in the analysis of food for a wide variety of tests. Enforcement action may be instigated for any non-compliant samples. Between July 2019 and June 2020, a total of 3,622 samples were submitted to BVAQ and other laboratories (Table 3).

Table 4. Samples submitted for compliance investigations

Category	Number of samples
Samples taken during audits and inspections	33
Foodborne illness investigations	1,178
Complaints and Compliance projects	2,411
Total	**3,622**

Samples taken during audits and inspections

Samples taken during audits usually consist of raw meat samples that have failed a field test for sulphur dioxide (SO_2), which is not permitted in raw meat (SO_2 is permitted in sausages to a certain level). If a field test is positive, a three-part sample is then taken and submitted to BVAQ for SO_2 analysis. Some of these samples can also be submitted for meat speciation. Sausage samples are occasionally submitted for SO_2 analysis to ensure they comply with the maximum permitted level in the Food Standards Code of 500 mg/kg.

Between July 2019 and June 2020, 1,718 audits of licensed retail meat businesses were conducted and 29 samples of raw meat from 12 butchers were submitted for SO2 testing as a result of a positive field test. Twenty-six of these samples from 11 butchers were non-compliant, with values ranging from 97 to 950 mg/kg. Three samples of sausages and/or sausage meat were taken during audit and submitted for SO_2 analysis and all samples had values below the maximum permitted level. One sample of raw meat was sampled for meat speciation testing and found to be not compliant. Appropriate enforcement action was taken or is planned to be taken for non-compliant samples.

Foodborne illness investigations

The Food Authority investigates suspected cases of foodborne illness in partnership with NSW Ministry of Health, local councils, and interstate agencies. Between July 2019 and June 2020, a total of 1,178 food and environmental samples were submitted for testing in response to foodborne illness investigations and their follow up activities. This number is

fewer than for the previous year which included samples taken as part of the *Salmonella* Enteritidis investigation linked to eggs. A notable outbreak is outlined below:

Salmonella Typhimurium foodborne illness investigation

Between January and April 2020, a large outbreak of *Salmonella* Typhimurium occurred, that affected over 1,000 people, including over 200 in NSW. As part of the national effort to find the source of the outbreak, over 590 food and environmental samples were obtained by the NSW Food Authority. This included over 300 bagged salad items, which had the strongest epidemiological link to the outbreak. Despite an extensive investigation no source for the outbreak was found.

Complaints and Compliance projects

Complaint samples usually result from either a member of the public contacting the Food Authority's helpline or from local council. Samples may be acquired from the complainant or from retail outlets, manufacturers or importers. Common complaints include unlabelled allergens, allergen contamination or poor labelling. Compliance projects usually result from an incident, increase in unknown illnesses, increase in a particular issue seen during audits or inspections or an overseas or interstate event.

Between July 2019 and June 2020, 2,411 samples were submitted for testing due to a complaint or compliance project. Compliance projects undertaken included *Salmonella* Enteritidis surveillance which accounted for 2,022 of these samples.

Complaint samples

Between July 2019 and June 2020, 67 samples were submitted for testing due to a complaint. Of the 67 samples, 43 samples were submitted for testing due to complaints regarding allergens in food. As a comparison, for the previous period (July 2018 to June 2019), 76 samples were submitted for testing due to a complaint, of which 8 samples were due to complaints regarding allergens in food.

Compliance projects

Several significant compliance projects were conducted this year include surveillance for *Salmonella* Enteritidis at egg farms, a survey for *Salmonella* and *Listeria monocytogenes* on rockmelons, and a microbiological survey of high risk horticulture.

Salmonella Enteritidis (SE) surveillance on egg farms

Salmonella Enteritidis (SE) is a bacterial disease of poultry, and the consumption of eggs contaminated with SE can present a high risk of causing foodborne illness in humans. This illness can be particularly severe for people who are elderly (over the age of 70), young children and those with a weakened immune system. In the past there have been *Salmonella* Enteritidis-related illness cases reported in Australia, however these have been typically in people who have travelled overseas, where they became infected.

Since mid-2018, a steady increase in the number of cases of SE illness in humans was observed. These cases were epidemiologically linked to a locally acquired outbreak of SE illness with most cases reported in NSW. During 2018-2019 a major investigation was conducted which involved testing a range of foods and environmental samples from a range of settings for the presence of *Salmonella*. During the investigation samples from egg primary production businesses were tested, including eggs and environmental samples. As a result, SE was found on thirteen properties which were interconnected by movements of people, eggs or equipment.

As part of the response to the outbreak, the NSW Department of Primary Industries (NSW DPI) increased surveillance and monitoring at egg farms and issued biosecurity directions to individual properties where necessary, including

quarantining of the premises to prevent the movement of eggs into the marketplace. Other actions taken included farm depopulation, decontamination and disinfection. Affected properties are unable to recommence egg production until required biosecurity and food safety standards are met.

Surveillance and monitoring activities at NSW egg farms continued in 2019-2020. In addition, extensive clearance sampling and testing was conducted on infected properties after decontamination and disinfection to allow them to recommence egg production. A total of 2,022 samples were tested. Surveillance, monitoring and clearance activities will continue in 2020-2021.

In August 2019, the Biosecurity (*Salmonella* Enteritidis) Control Order 2019 came into effect. The Control Order aimed to prevent, eliminate, minimise and manage the biosecurity risk posed or likely to be posed by the spread of *Salmonella* Enteritidis in NSW. The Control Order was amended on 30 June 2020 to include a requirement for all licensed egg business in NSW to undertake mandatory SE testing from 1 July 2020. Sampling and testing is required every 12 to 15 weeks for the duration of the Control Order. NSW Department of Primary Industries (NSW DPI) is funding the cost of laboratory testing for the first two years of the program.

Rockmelon survey

Routine testing of rockmelons was undertaken between February to March 2020 to verify the effectiveness of food safety systems. No *Salmonella* or *Listeria monocytogenes* was detected on any of 120 samples obtained, demonstrating the ongoing good performance of the melon industry in managing these hazards.

High risk horticultural products

In the second half of 2019, the Food Authority commenced preliminary inspections of primary production facilities involved in the growing and harvest of high risk horticultural products – in particular berries and leafy green vegetables. The aim of these inspections was to gain a greater understanding of the processes used in the growing and harvest of these food products and the potential food safety hazards that may present during that process. A variety of growers were inspected and their agricultural practises, including hydroponic and organic, were examined. A small number of facilities also had environmental and product samples collected. The learnings from these initial inspections will be part of a larger project looking at the food safety risks associated with the growing and harvest of leafy greens that will occur during 2020-21.