REVIEW OF EGG STAMPING IMPLEMENTATION IN NSW

Department of Primary Industries
Food Authority

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Front cover photo: Examples of egg stamps commonly found in NSW supermarkets

Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
DPI	Department of Primary Industries
ES	Spain
FSANZ	Food Standards Australia New Zealand
FSC	Food Standards Code
FTE	Full Time Equivalent
IGA	Intergovernmental Agreement
NL	Netherlands
NSW	New South Wales
NT	Northern Territory
PC	Productivity Commission
QLD	Queensland
RIS	Regulatory Impact Statement
The Standard	Standard 4.2.5 *Primary Production and Processing Standard for Eggs and Egg Products*
TR	Turkey
U.S.	United States
USFDA	United States Food and Drug Administration
WA	Western Australia

Executive summary

Egg stamping was introduced in NSW in November 2014 to improve traceability, as eggs and raw egg products are one of the leading sources of *Salmonella* related foodborne illness outbreaks. Egg stamping was part of new national standard for eggs, introduced nationally in 2012.

In December 2015 the NSW Food Authority (Food Authority) conducted a review of the implementation of egg stamping, to determine if the program had been successful to date and that the impact on the egg production industry are minimised and ameliorated where possible.

The Food Authority conducted the review between December 2015 and February 2016. The review examined information collected prior to the introduction of egg stamping, internal Food Authority data, external egg industry information and new information gathered from egg production and processing businesses in NSW.

The review covered the following areas:

- whether egg stamping has improved traceability
- impact of egg stamping on egg producers including operational costs, labour and resourcing
- implementation of egg stamping in other jurisdictions
- actions to improve implementation of egg stamping by industry
- literature review on the efficacy and cost effectiveness of egg stamping or similar programs
- how well has egg stamping been adopted at markets and retail venues
- whether egg stamping has changed the prevalence of dirty eggs
- any outstanding matters of concern or issues which need to be addressed for egg stamping

The review found that egg stamping has improved traceability of eggs across NSW as well as traceability for individual businesses. NSW egg producers and processors that sell eggs to retail are now stamping, with 935 registered egg stamps on the Food Authority's database. Stamping has also improved traceability for foodborne illness investigations, with an egg related foodborne illness outbreak investigation in May 2015 able to rapidly identify the affected eggs and trace the eggs to the Queensland based supplier. Queensland authorities were then able to rapidly identify where affected eggs had been distributed and instigate a targeted recall.

Some producers have also reported unexpected benefits of egg stamping, with 26 percent of surveyed producers reporting benefits for their own business from enhanced traceability delivered by egg stamping such as authenticating whether their eggs were actually associated with reported consumer complaints.

In the main, egg stamping has not impacted productivity for the number of egg businesses licensed with the Food Authority or the NSW egg industry. Results from the 2016 egg industry survey about the cost of egg stamping were compared with estimates made in 2009 by the Productivity Commission and were found to be half the cost estimated for small producers and one third the cost for medium sized producers.

All Australian jurisdictions require hen, duck and quail eggs for retail sale (other than from the farm gate) to be stamped, with some exceptions in Victoria. Victoria exempts producers with less than 50 hens (approximately 20 dozen eggs in any week) from stamping and all duck and quail eggs. Eggs sold directly from the farm gate are exempt from stamping in NSW and Tasmania provided sales do not exceed 20 dozen per week. Egg stamping is

mandatory in the 28 member countries of the European Union and widely applied in Israel and Singapore but not required in the United States of America.

In order to assist the egg industry with the costs of implementing egg stamping and general regulatory burden on small business, in 2012, the Food Authority delayed the implementation of stamping for two years to allow producers to prepare and budget for the changes, supplied 850[1] free hand egg stamps to small egg producers and introduced a licence fee waiver for licensed egg businesses that produce less than 100 dozen eggs in any week. The fee waiver has reduced the cost to the egg industry by $150,000. The Food Authority also implemented a policy to allow egg businesses to report equipment failure to the Food Authority within 24 hours and seek exemption from egg stamping for a specified period of time, until equipment is repaired.

The international and national literature review revealed little information on the efficacy and cost effectiveness of egg stamping or on similar programs. The most recent data on egg stamping is contained in the Food Authority's recent survey of licensed NSW egg businesses.

Egg stamping is checked at retail venues by local government. Large retail businesses understand the egg stamping requirement and will not accept eggs unless they are stamped. Markets and retail venues are routinely inspected by the Food Authority and local councils for compliance. Eggs are checked for stamps, cracks and cleanliness (dirt) at these venues as part of the inspection process.

Egg stamping does not guarantee that cracked or dirty eggs will be unable to reach the market. Provision of cracked and dirty eggs for sale has been an offence in NSW since 2010. Stamping provides the means to quickly identify the producer of dirty eggs and hold them accountable.

The issue of automated egg stamping machinery breaking down and the impact this is having on time and money costs to businesses was of concern for a number of producers in the 2016 egg industry survey. This is a concern as the equipment is new and it is likely that equipment breakdowns will increase over time as equipment ages. Whilst the Food Authority has a policy in place in case of equipment failure so business can still trade, further investigation into the cause of equipment breakdown is needed. Some producers have requested that more information and guidance be provided on maintenance and purchase of stamping equipment.

Overall egg stamping has been implemented at lower costs than those estimated by the Productivity Commission in 2009 and has improved the speed and reliability of egg traceability in NSW. Egg businesses, both licensed and non-licensed, are now egg stamping and the Food Authority has an egg stamping database which provides details for each egg producer. Egg stamping has improved the speed of traceability and has improved targeting of egg recall information.

[1] Correct as of December 2015

Introduction

Eggs and raw egg products are one of the leading sources of *Salmonella*, and in the event of an outbreak, tracing the egg back to the farm to assist with minimising the human health impacts can be an issue. Egg stamping was introduced nationally to combat this issue and improve traceability.

In December 2015, egg stamping by egg producers and processors in NSW had been in place for 12 months and this review examines how implementation has progressed. Regular review of the impact of policy changes meets NSW Government requirements for evidence based decision making, and meets the NSW Government's Food Safety Strategy goal to mitigate and manage food safety risks to community and industry.

Key review questions

The review included the following questions:

1. Has egg stamping improved traceability?
2. What has been the impact of egg stamping on egg producers including; operational costs, labour and resourcing impacts?
3. How has egg stamping been implemented in other jurisdictions?
4. What actions have taken place to improve implementation of egg stamping by industry?
5. Is there any contemporary literature on the efficacy and cost effectiveness of egg stamping or similar programs?
6. How well is egg stamping being adopted at markets and retail venues?
7. Has egg stamping changed the prevalence of dirty eggs?
8. Are there any outstanding matters of concern or issues which need to be addressed for egg stamping?

Review methodology

The review considered information collected prior to the introduction of egg stamping, internal Food Authority data, and external egg industry information and collected new information from egg production and processing businesses to determine how the implementation of egg stamping is progressing in NSW.

1. Food Authority data reviewed:
    a. Previous egg stamping and egg industry survey work
    b. Licensing data; the number of type of egg businesses and how these have changed over time
    c. Egg Industry Consultative Committee meetings and their input into decision making
    d. Submissions and complaints about egg stamping, and compliance to egg stamping
    e. Compliance inspections of markets in NSW
2. External information:
    a. Overall NSW egg industry profile
    b. Egg related foodborne illness outbreaks
    c. Egg recalls
    d. Experiences from other jurisdictions
3. Direct consultation with egg producers – survey of licensed NSW egg producers.

Background

Legislative requirements

The NSW Egg Food Safety Scheme was first introduced in 2010, under the NSW Food Regulation. This was followed by the national Standard 4.2.5 *Primary Production and Processing Standard for Eggs and Egg Product*, under the Australia New Zealand Food Standards Code (FCS) gazetted in May 2011 and enforceable from November 2012. The purpose of implementing the NSW Egg Food Safety Scheme and national Standard 4.2.5 was to manage foodborne illness risks associated with eggs and egg products.

Standard 4.2.5 was developed by Food Standards Australia New Zealand (FSANZ) to address the prevalence of dirty and/or cracked eggs in the market and the absence of a national system to ensure eggs and egg products could be quickly traced to their place of production. Development commenced in 2006 and included two rounds of public consultation and preparation of a Regulatory Impact Statement. The decision to adopt the standard was made by Ministers with responsibility for food regulation on 6 May 2011. The requirement to mark each shell egg with a unique identifier (stamp) was introduced nationally on 26 November 2012 under Standard 4.2.5 *Primary Production and Processing Standard for Eggs and Egg Products*.

NSW is a signatory to the intergovernmental Food Regulation Agreement which requires all jurisdictions to implement the FSC and this requirement was implemented in NSW law through the *Food Act 2003*. NSW adopted Standard 4.2.5 on 26 November 2012, with the exception of egg stamping. Stamping commenced in NSW on 26 November 2014 following a two-year lead in to allow industry time to implement. This enabled egg producers to plan for and purchase equipment and for the Food Authority to address any issues and determine how best to implement the changes. This change affected 198 licensed egg facilities in NSW and numerous unlicensed small scale egg producers producing and selling less than 240 eggs per week. A timeline for development of the Standard is provided at Appendix 1.

Standards contained within the FSC can only be amended if agreed by the Ministerial Forum on Food Regulation.

The movement of goods and services across states and territories is also regulated by the *Mutual Recognition Act 1992*. The purpose of mutual recognition is to create a national market for goods and registered occupations, whereby a good that may be legally sold in one jurisdiction may also be legally sold in another jurisdiction.

Egg related foodborne illness risk

A scientific assessment of the public health and safety of eggs and egg products in Australia was undertaken by FSANZ in 2009 (FSANZ, 2009) as part of developing national Standard 4.2.5. The assessment concluded that the main microbiological hazard associated with these products was *Salmonella*. *Salmonella* are bacteria that can infect laying birds and are pathogenic to humans, causing gastroenteritis.

The purpose of the introduction of the national Standard 4.2.5 (FSANZ, 2012) was to reduce the incidence of foodborne illness from *Salmonella* by minimising the prevalence and concentration of this pathogen in eggs and egg product (FSANZ, 2011).

Egg related foodborne illness outbreaks are the second most commonly reported foodborne illness in Australia. The majority of outbreaks are traced to food products made from raw or undercooked eggs such as raw egg mayonnaise, tiramisu desserts, fried ice cream and hollandaise sauces. It is scientifically verified that *Salmonella* can live both inside and outside of eggs that are normal in appearance. Chicken faeces harbour *Salmonella* and can contaminate the outside of the egg shell. If eggs are not properly cleaned and graded and kept in a temperature controlled environment, *Salmonella* can migrate inside the eggs and multiply to levels that are

hazardous and cause a foodborne illness outbreak if consumed. Products made from raw eggs contaminated with *Salmonella* also can support its persistence and growth if time and conditions permit.

The lack of traceability for eggs, once they were removed from their packaging, had compounded difficulties in investigating egg related foodborne illness outbreaks. To combat this issue the requirement for a unique identifier for all eggs was added to the Standard.

Foodborne illness outbreaks associated with egg consumption are provided in Table 1.

Table 1. Egg related foodborne illness outbreaks 2009-2014 – NSW and national statistics

Pathogen – *Salmonella* types[2]						
	NSW[3]			National[4]		
Year	Number of incidences	Number of people affected	Number of people hospitalised	Number of incidences	Number of people affected	Number of people hospitalised
2009	6	152	31	10	196	32
2010	13	267	46	12	205	19
2011	9	141	23	20	396	16
2012	11	134	6	18	179	30
2013	4	77	33	15	337	45
2014	9	143	13	No data[5]	No data	No data
Total	52	914	152	75	1313	142

Between 2009 and 2014, there were 52 egg related foodborne illness outbreaks in NSW affecting 914 people with 152 hospitalisations. Nationally between 2009 and 2013 there were 75 outbreaks with 1,313 people affected and 142 hospitalisations. Individuals affected by egg related foodborne illnesses frequented hospitals more often when compared to other foodborne related illnesses. Many outbreaks were caused by *Salmonella* in poorly processed and/or poorly handled foods containing raw egg. International data highlighted that Australia had rates of infection among the highest in the industrialised world and that many other countries had initiated successful interventions, particularly in the egg industry (Figure 1). *Salmonella* infection usually causes diarrhoea, but can also result in systemic illness and focal (localised) infections. Illness caused by *Salmonella* infection usually lasts 4-7 days and people generally recover without treatment. However, illness may be severe in some people resulting in hospitalisation and sometimes death. Overall, salmonellosis represents a significant burden of illness in Australia. It has significant associated costs in terms of lost productivity, primary care and hospital care.

[2] There are different species of salmonella. All species have been shown.

[3] Data for NSW egg related foodborne illness outbreak was sourced from NSW OzFoodnet annual reports.

[4] Data for National egg related foodborne illness outbreak was sourced from OzFoodnet quarterly reports.

[5] Data not available at the time of the review.

The foodborne illness statistics demonstrates there is a continued need for effective traceability of eggs. The large number of people affected and hospitalised confirms the importance of improving the speed of traceability.

Salmonella Enteritidis and egg stamping

Australian laying flocks are not endemic carriers of the *Salmonella* Enteritidis (SE) bacterium unlike the United States, European and Asian countries. SE is a notifiable disease in Australia.

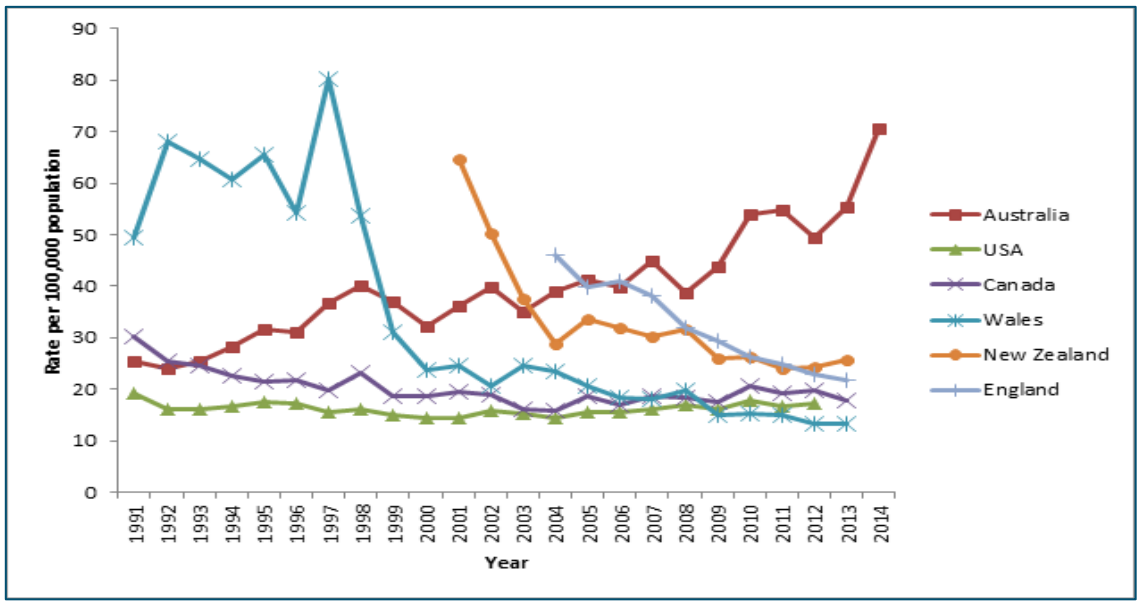
SE can reside inside an apparently normal egg and if eaten raw or undercooked, can cause serious illness. Unlike other *Salmonella* types, SE silently infects the ovaries of apparently healthy hens and contaminates eggs before shells are formed. It is the most commonly detected type of human salmonellosis in Europe, where egg stamping is mandatory.

There is an ongoing risk of SE infection in Australian laying flocks which is currently managed by biosecurity measures. Should locally acquired SE emerge in Australia, egg stamping will be essential to limit the extent of SE outbreaks by facilitating rapid trace-back and targeted quarantine measures.

Salmonella cases in Australia compared to other countries

The figure below shows that salmonellosis notification rates per population in Australian is increasing compared to decreasing rates in other countries.

Figure 1. Salmonellosis notification rates (all serotypes combined) per 100,000 populations in Australia, Canada, Wales, England, New Zealand and the United States of America (1991-2014)[6]

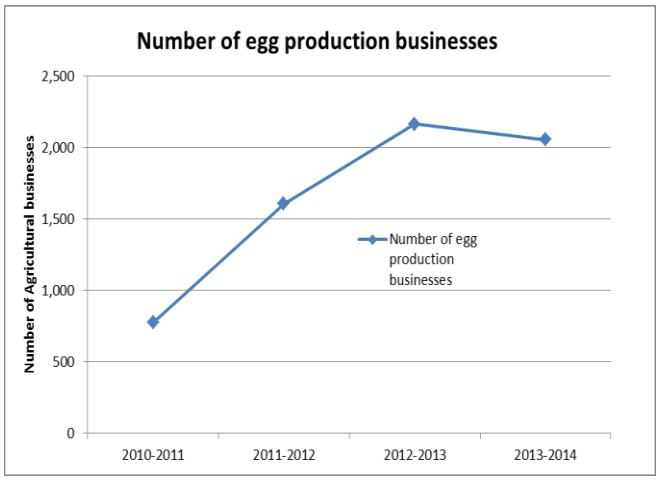


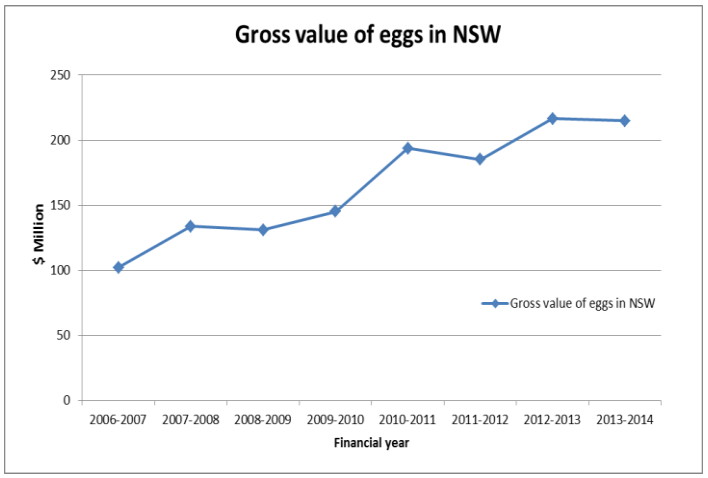
[6] Communicable Diseases Network Australia (CDNA) (2016) *Salmonella* and Eggs in Australia. A report by the *Salmonella* and Eggs Working Group.

NSW egg industry profile

Data from the Australian Bureau of Statistics shows that the number of egg production businesses and the value of eggs have increased in NSW in the past five years.[7] The number of egg production businesses has increased from 777 in 2010-2011 to 2,057 in 2013-2014. The gross value of eggs has grown from $102.2 million to $214.8 million between 2006 and 2014.

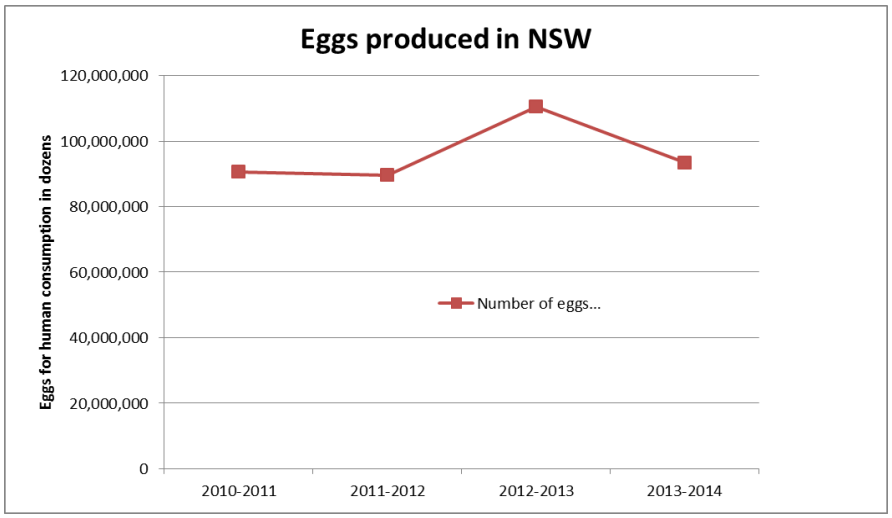
Figures 2 and 3. Number of eggs produced and gross value of eggs in NSW





The number of eggs produced has varied over time with an overall slight increase since 2010.[8] Figure 4 displays egg production numbers over period 2010-11 – 2013-14.

Figure 4. Egg numbers in dozens



[7] Source: ABS – correct at 23 September 2015 – catalogue 7503
http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/7503.0Main+Features12013-14?OpenDocument

[8] http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/7503.0Main+Features12013-14?OpenDocument

Egg stamping and traceability improvements

Since the introduction of egg stamping in 2014 (NSW) there has been one case where a foodborne illness outbreak investigation was assisted by egg stamping which was used to trace eggs back to an interstate producer. There has also been a Queensland example where egg stamping was used to rapidly trace eggs back to the farm.

Egg traceability case study 1

In May 2015 the Food Authority was notified of a *Salmonella* outbreak affecting at least 11 people who had consumed food from a resort in northern NSW. The outbreak was initially detected as a result of three NSW residents with a specific *Salmonella* type, being identified through medical test results. An investigation was conducted by the NSW Ministry of Health and interviews held with the NSW residents, which identified a restaurant at the resort as the common link between affected persons. Further investigations revealed that another four different groups had exposure to the restaurant from 16-19 April 2015. The majority of people reported consuming a dessert containing raw eggs and one person that did not consume this dessert had soft poached eggs for breakfast from the same restaurant.

A joint investigation by the Food Authority and the local council found that the eggs had been supplied through a distributor to the resort in bulk packs. These packs did not have producer and processor information which could have created a lengthy trace-back investigation. The eggs were stamped and this resulted in a quicker process to determine where the eggs originated from.

The eggs originated from a Queensland farm, and the information was provided to regulators in that jurisdiction for follow-up. It was found that this business had been implicated in other *Salmonella* cases and a review found numerous issues on farm, including cracked and dirty eggs being sold to the public. Under the guidance of Safe Food Production Queensland, the farm instigated a recall to remove eggs from the market. The egg stamp was used in this recall process so that retailers and restaurant could easily identify the recalled eggs.

Without the capacity to rapidly trace the eggs to the Queensland farm, it is likely that other consumers and businesses would have been exposed to substandard product, and very likely salmonellosis. This had the potential to greatly increase the level of exposure to *Salmonella* and may have resulted in several more cases of illness or outbreaks. It also ensured that the recalled eggs could be quickly identified by purchasers, disposed of and improvements made by the implicated Queensland egg producer.

Egg traceability case study 2

In 2007 in Queensland, 73 individuals were affected by foodborne illness linked or likely linked to egg farm practices. There were seven separate outbreaks involving the 73 individuals and all were traced to one egg farm within 48 hours of reporting. Again in 2010, 34 individuals were affected by foodborne illness linked to egg farm practices and the Queensland regulatory authority, Safe Food Production Queensland, was able to trace the eggs to one farm within 24 hours.

A quick turnaround time in tracing the eggs to the responsible farm was because the Egg and Egg Products Food Safety Scheme was introduced by Queensland in 2005. A quoted paragraph from FSANZ RIS in support of Standard 4.2.5 reads;

"*After Queensland introduced its Egg and Egg Products Food Safety Scheme in 2005 there has been a reduction in the number of identified outbreaks where eggs were suspected as the cause of illness, although this reduction has not necessarily been reflected in the total number of notified salmonellosis cases in Queensland. More important however is the fact that traceability improves outbreak control and reduces the incidence of illness should there be an outbreak.*"

The key benefit served is improved outbreak control through accurate and prompt traceability of affected product. Both the 2007 and 2010 foodborne illness outbreaks, post introduction of the Egg Food Safety Scheme in Queensland, enabled faster trace-back to the farm of origin whereas the outbreaks prior to the scheme (1996-2003) were untraceable. There were 12 incidences of egg related foodborne illness outbreak in Queensland during 1996 to 2003 affecting almost 800 individuals. Of the 800 individuals affected, 56 were hospitalised and two deaths were reported. Due to a lack of traceability arrangements, the source of the eggs could not be determined.

It has been noted that traceability provides significant benefits to industry in identifying the source of contamination in the event of an outbreak therefore saving major industry losses due to loss of consumer confidence and withdrawal of unaffected, safe products from the market.

Speed of traceability

The ability to rapidly trace eggs back through the supply chain, to the point of origin significantly aids in shortening foodborne illness investigation timelines as the source of the eggs is certain. Whether the incident is related to an on-farm food safety issue or an issue originating from an egg processor, stamps allow direct traceability through the food supply chain to occur. The absence of stamps would present a situation where a foodborne illness with suspected egg links would; firstly need to determine what eggs or egg products are implicated, secondly instigate enquiries to determine to clarify the source of the eggs and contact the supplier, thirdly determine the extent of distribution and then lastly execute a recall of affected product. Without any means to target the recall of specific product, the default approach is likely to involve the complete removal of all a producer's eggs from the market, adding unnecessary time and cost to a recall process. Without any means to specifically identify affected product (i.e. eggs removed from outer packaging), there is also the risk of affected product not being disposed of.

Traceability of eggs is provided by both the egg packaging and the egg stamp. The egg packaging usually displays information about the company name and address and the best before date. The egg stamp provides information about the processor or producer and is particularly important when packaging is removed or recycled. Large bulk packs of eggs used by catering businesses or large restaurants are not packed in individual cartons and therefore

do not have packaging traceability information, making egg stamping very important in trace-back investigations. An outbreak in QLD, involving catering pack eggs was only traced, by virtue of egg stamping. (Craig Shadbolt, personal communication, November 18, 2015)[9]

The numbers of foodborne illnesses show that there is continued need for a robust system to trace the eggs back through the supply chain. Foodborne illness outbreaks, caused by consumption of raw eggs and egg products, continue to be high as are the number of people hospitalised compared to other causes of foodborne illnesses. In 2014 there were 9 incidences of egg related foodborne illness in NSW resulting in 143 people getting sick of which 13 were hospitalised.

NSW egg producers and processors that sell eggs to retail are now stamping. There are 935[10] registered egg stamps on the Food Authority database which immediately improves the ability of the NSW Government to trace egg stamps back to the producer. The Food Authority is regularly checking compliance to egg stamping.

Interstate traceability of eggs has also improved. Egg stamps are compulsory in all states and territories of Australia. This means that if there are issues with eggs originating from interstate, these eggs can be traced back to the producer or processor within that state.

Egg industry 2016 survey results revealed that after 12 months, 26% of producers had already noticed improved traceability from egg stamping for their own businesses. These producers were able to authenticate where the eggs had been produced from, if they received a complaint from a customer.

Targeting recalls

Egg stamps were thought to improve the targeting of product recalls. This means that there are less industry losses and unnecessary recall of safe product from the market. A food recall is usually initiated by the food business upon discovery that the food is unsafe or unsuitable either through their own verification/testing program or from reports received through a number of sources. The food business is required to contact Food Standards Australia New Zealand (FSANZ) and the state or territory food enforcement agency as soon as they consider a food recall is, or may be needed. FSANZ coordinates all food recalls on a national level and the Food Authority is responsible for monitoring food recalls and liaising with manufacturers in NSW. The Food Authority also has the power to mandate a food recall if required.

There have been a number of recalls concerning eggs over the past several years nationally with two of the recalls affecting NSW. Egg recall details for the period 2007 through 2015 are provided in Table 2. Most of the recalls were triggered at consumer[11] level and one at trade[12] level. The reasons for recalls were either due to dirty or cracked eggs or microbial presence of *Salmonella*.

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[9] Dr Craig Shadbolt, Manager, Food Incidence Response and Complaints, NSW Food Authority

[10] Data correct at 22.09.2015

[11] Consumer level recall is when food has been sold to consumers

[12] Trade level recall is conducted when the food has not been sold to consumers; recovery of products is from distribution centres and wholesalers.

Table 2. Egg recalls 2007-2015 – Australian Competition and Consumer Commission food recalls register

Date	Brand	Product Name/Size	Company	Company Location (State)	Defect/ Reason for Recall	Distribution	Recall Types Consumer = C Trade = T
30/10/15	First Quality Free Range Eggs	Eggs	EES Marketing Pty Ltd	QLD	Dirty cracked eggs	QLD	C
22/05/15	Fresh as	Whole eggs, various sizes	William's Eggs	QLD	Cracked eggs	QLD (NSW boarder)	C
12/03/15	Darling Downs	Eggs	RL Adams Pty Ltd	QLD	Dirty eggs	QLD,NSW, NT	C
05/03/14	Golden Egg Farms	Golden Egg Farms Pasteurised & Homogenised Whole Egg 10kg	Westcoast Eggs Pty Ltd	WA	*Salmonella*	WA	T
Prior to egg stamping requirement nationally							
02/03/11	Jacobs Well Egg	Eggs	Jacobs Well Egg Farm	QLD	*Salmonella*	QLD	C
16/06/10	Eggs. Jacobs Well Egg Farm Cage Eggs	All Jacobs Well Egg Farm Eggs: Medium-500g Large-600g Extra Large-700g Jumbo-800g	Jacobs Well Egg Farm	QLD	*Salmonella*	South East QLD	C
05/03/07	Free range eggs	Eggs, 600g, 700g, 800g	Game Farm Enterprises	QLD	Dirty cracked eggs	QLD	C

Three recalls occurred in 2015 and one of these recalls advised consumers that if they had eggs stamped with unique identification number 036-063 (egg stamp), they should return them to the store for refund. Egg stamping provided consumers with very specific information on which eggs were affected by the recall.

Another egg recall was initiated by Safe Food Production Queensland in 2015. This recall affected NSW because a proportion of the Queensland produced eggs were sold into NSW. The egg stamp was advertised in the food recall information making the recall more targeted.

The benefit of using egg stamps to better target recalls was confirmed by the 2016 egg industry survey where a large egg processer stated that egg stamps helped his business better target recalls if there was an issue.

Overall egg traceability in NSW has improved because of egg stamping. Egg businesses, both licensed and non-licensed, are now egg stamping and the Food Authority has an egg stamping database which provides details of the egg producer. Egg stamping has proven to have improved the speed of traceability and has improved targeting of egg recall information.

Impact of egg stamping on egg producers including operational costs, labour and resourcing

Scale of the NSW egg industry – who needs to stamp?

Not all egg producers and processors in NSW are required to stamp their eggs due to exemptions under the NSW Food Regulation 2015. There are currently 198[13] egg production and processing facilities licensed by the Food Authority that are required to stamp eggs with a unique identifier. Only facilities with production above 240 eggs per week are licensed.

Egg primary producers do not need to stamp their eggs if they sell directly to an egg processor, who then applies a stamp to each egg on the producer's behalf. There are 105 such producers in NSW.

There are many egg producers producing fewer than 240 eggs per week, who are required to stamp their eggs as they are sold through the retail supply chain (e.g. supermarkets, grocers etc.). Eggs sold direct from the farm gate from these businesses are exempt from stamping.

The Food Authority maintains an electronic record of egg stamping information (e.g. alpha numeric code, images) as part of businesses overall compliance history. To assist egg producers comply with stamping, the Food Authority has provided 850 hand egg stamps free of charge. Some producers have purchased their own stamps.

Table 3: Number of facilities which are required to egg stamp

Description	Egg stamping requirements	Numbers of facilities
Egg producers, producing above 240 eggs a week and sell their eggs to retail. These businesses are licensed by the Food Authority	Required to egg stamp	198
Egg producers, producing above 240 eggs a week and send their eggs to graders. These businesses are licensed by the Food Authority	Not required to egg stamp. Egg processors/graders are required to stamp	105
Egg producers producing less than 240 eggs a week and selling their eggs to retail. These businesses are not licensed by the Food Authority	Required to egg stamp	715
Egg producers producing less than 240 eggs a week and selling their eggs via the farm gate. These businesses are not licensed by the Food Authority	Not required to egg stamp	Not recorded

Concern was raised that egg stamping costs would cause egg production businesses to leave the industry. Table 3 compares egg licensee numbers in November 2011 with numbers in August 2015. This reveals an overall increase in licensee numbers of 24.3%.

[13] correct at 16 February 2016

Table 4. Changes in number of licensed egg facilities over time

Type of licence	Number of licensed facilities at 30.11.2011	Number of licensed facilities at 10.08.2015	% change
Total licensed egg primary production businesses with additional activities such as grading and washing	125	164	23.8% increase
Total licensed egg primary production businesses (egg producers)	74	99	25.3% increase
Total	199	263	24.3% increase

Since 2013, 22 egg producers producing between 20 dozen and 100 dozen eggs a week and 14 producers of over 100 dozen eggs a week are no longer licensed. The reason for cancelling a licence is recorded and egg stamping has not been listed as a motivating factor.

January 2016 egg industry survey results

An egg industry survey of licensed egg producers was conducted in January 2016 to determine actual costs of egg stamping and to ask producers about their implementation experience. This survey sampled 100 producers representing 52% of all NSW licensed egg producers, which produced more than 95% of the eggs in NSW.

There is no industry set definition of how to classify small, medium or large volume egg producers. Egg producers vary widely in their production methods, the number of hens managed and the number of eggs produced each day. A cage egg producer may describe themselves as “small” if they have any number of hens, anywhere between 700 and 15,000, whilst a free-range egg producer with above 8,000 hens, may consider themselves “medium” sized.

Table 5 below shows the number of hens per production system for surveyed producers. Ninety six of 100 producers surveyed were currently producing eggs, 82 of these were producing free range eggs, 22 had cage systems and eight barn laid. A number of producers had both cage and free range systems and a few had free range and barn systems. Only two producers had all three systems. Six free range egg producers were producing organic eggs. Most businesses had free range production systems although many of these had flock sizes around 1,500 hens. Cage egg production systems had the largest number of hens per producer.

Table 5. Statistics on the number of hens in NSW and the type of production system

	Number of caged hens	Number of free range hens	Number of barn hens
Minimum	700	6	3,000
Maximum	2,027,000	400,000	100,000
Average	173,632	21,890	47,500
Median[14]	45,000	1,500	47,000
Total number of hens	3,819,900	1,794,990	380,000
Number of egg producers	22	82	8

[14] Median is the middle score.

Impact on egg producers that are hand stamping (small volume egg producers)

Fifty three egg producers interviewed were stamping their eggs by hand. Eggs from both cage systems and free range systems were hand stamped. No barn laid egg producers who hand stamped were identified in this survey. The number of eggs stamped by hand per day ranged from less than a dozen up to 712 dozen eggs. Five cage egg producers were interviewed who were hand stamping and these systems ranged between 700 hens up to 9,000 hens. Forty nine producers had free range systems and were hand stamping. Hen numbers from free range systems varied between six and 6,000 hens.

Set up costs

Free egg stamps were provided by the Food Authority which meant that there were no initial costs for egg stamping equipment for these producers. Fourteen percent (n=12) of those interviewed purchased their own hand stamps which cost between $90.00 and $2,500. Some producers bought a number of egg stamps to use at once to stamp a carton of eggs in one go.

The costs for the first year of egg stamping by hand per dozen eggs was estimated for those producers who had purchased an egg stamp to be between almost nothing to a maximum of 25 cents per dozen. If the Food Authority provided the stamp then the initial setup costs were zero. The higher costs were borne by those businesses which had purchased an egg stamp and had very low numbers of hens.

Ongoing costs

Ongoing costs of egg stamping by hand varied between zero to a maximum of 17 cents per dozen with a median cost of less than one cent per dozen. The higher costs were borne by the businesses which had purchased hand stamps and were stamping very few eggs.

Ongoing costs include the purchase of ink refills for the hand egg stamp.

Time costs

Most businesses hand stamping reported that stamping was taking very little time – below half an hour a day “a few seconds per box” with the exception of quail and duck egg producers. The estimated cost per business per day spent on egg stamping is less than $21.53[15]. This figure was calculated based on the default wage data by occupation and employee on-cost multiplier of 1.75 published by the Better Regulations Office of the NSW Government. Businesses did not employ additional staff due to egg stamping.

Time costs for stamping of quail and duck eggs went against this trend and the hand stamps were taking 2 to 3 hours per day or more than 3 hours per day. Quail eggs were of particular issue due to their colouring, size, shape and fragility. The cost per business to stamp quail and duck eggs is estimated to be $129.15 per day.

Table 6. Cost impact on small producers using hand stamp

Costs	Range	Median
Set up	0 to 25 cents / dozen	<1 cent / dozen
Ongoing	0 to 17 cents / dozen	<1 cent / dozen
Time cost	0.12 cents / dozen (0 - 180 mins / day)	<$21.53 / day (< 30 mins / day)

[15] Calculation: $24.60 (hourly labour cost) * 0.5 (half an hour) * 1.75 (on-costs such as superannuation)

Impact on egg producers using automated stamping equipment (medium volume egg producers)

To meet egg stamping requirements, larger egg producers and processors have had to purchase egg stamping equipment which requires maintenance and staff time. The cost of implementing egg stamping has been highly variable and dependent upon the size of the business, the type of equipment already in use and the number of eggs stamped. Automated stamping equipment ranges from small ink jets to large stamping machines that can be integrated into grading and sorting machines. These machines have been purchased from Holland, Germany, China and America.

Set up costs

Thirty one egg producers, managing between 1,000 and 160,000 hens, purchased automated egg stamping equipment. The cost varied between $2,000 and $30,000. The purchase cost of equipment did not have a close relationship with the number of hens managed or the number of eggs produced. For example three producers purchased egg stamping equipment costing $15,000. The number of dozen eggs per day these producers stamped varied between 271 and 4,608. One producer in this sample sorted and stamped eggs for other egg producers.

Twelve medium sized egg producers had caged systems, 22 had free range and five had barn systems. Some producers had both cage and free range systems. The number of dozen eggs stamped each day varied from 54 to 12,333 dozen.

The set-up costs for these producers was between less than one cent per dozen over the first year to a maximum of 25 cents per dozen. The producers with the highest costs per dozen in the first year had purchased automatic equipment but had very few hens and were stamping low numbers of eggs.

The median cost of egg stamping for medium sized producers in the first year was three cents per dozen.

Ongoing costs

Maintenance costs for equipment each year for medium sized egg producers who were using automated equipment, varied between producers with a median cost of $1,510 per year. One producer reported ongoing stamping machine problems that were estimated to have cost close to $11,300 for that year. The three producers with the highest costs per dozen eggs in the first year had low numbers of hens and had purchased automated stamping equipment rather than using a hand stamp.

On-going costs for automated equipment includes service costs, ink and “make-up” (the thinner used to keep the ink flowing).

Ongoing costs for medium sized business were estimated to be 1 cent per dozen.

Time costs

Most businesses using automated stamping equipment, reported low time costs, below half an hour per day. Many reported issues with equipment failure and the time impact of equipment failure on their businesses. The estimated cost per business per day spent on egg stamping related activities is $21.53. Businesses did not employ additional staff to undertake egg stamping.

Table 7. Cost impact on medium sized producers using automated equipment

Costs	Range	Median
Set up	0 to 25 cents / dozen	3 cents / dozen
Ongoing	0 to 6 cents / dozen	1 cent / dozen
Time cost	0.12 cents / dozen (0 - 180 mins / day)	< $21.53 / day (< 30 mins/day)

Cost impact on large volume egg producers

Most large volume egg producers had started egg stamping prior to NSW regulation change as they were selling their eggs interstate and needed to stamp in order to meet the state and national regulations.

One large egg producer estimated that the cost of egg stamping equipment was $40,000, the maintenance cost was $8,000 per year and one hour a week of time was needed to maintain the equipment.

Four large egg producers and processors were surveyed who had purchased egg stamping equipment. These producers were sorting, egg stamping, and packing their own eggs and eggs produced under contract from other producers. These large businesses have dedicated egg grading floors, quality control procedures which include routine checking of egg stamping and preventative machine maintenance programs. These producers had purchased a number of stamping machines and had spare machines in case of breakdown. Due to the large volume of eggs, the number of facilities, and complexity of these businesses, costings per dozen eggs have not been calculated.

Total cost impacts of egg stamping

The concern expressed about egg stamping putting small egg producers out of business does not appear to have occurred. The number of licensed egg producers in NSW has increased by 24.3% over the period 2011-2014.

Overall egg industry production figures from the ABS show that NSW egg production has increased slightly over the period 2011-2014, and the gross value of eggs has increased by more than 50% over the period 2006-2014.

Small egg businesses which are hand stamping have had minimal setup costs, low ongoing costs and stamping is usually taking less than half an hour a day with the exception of quail and duck egg producers.

Medium sized egg businesses[16] vary in the number of hens being managed, the number of eggs being stamped and the price of machinery purchased. Egg stamping is cheaper per dozen eggs in the first and subsequent years if the through-flow of eggs is higher. The businesses which have the highest cost are those businesses which have few hens but have purchased automated equipment.

The survey results revealed that the cost of egg stamping in NSW was significantly lower than that estimated by the Productivity Commission. In 2009 the Productivity Commission estimated the cost of egg stamping by business size, based on information from Queensland. At that time Queensland was the only state implementing egg stamping. Table 6 shows the actual costs of egg stamping in NSW based on the survey results compared to the Productivity Commission estimates. Four producers out of the 100 surveyed were classified as larger producers. These egg producers have very different business models to others, some were stamping for years before the NSW stamping requirement was introduced, and are supportive of egg stamping as it enables their businesses to

[16] Medium in this case refers to those businesses which have purchased automated stamping equipment less than $30,000.

trace their eggs and to better target recalls if needed. Due to the variability of these businesses egg stamping costs have not been shown.

From the survey sample there were three farms which fell into the medium category described by the Productivity Commission. In the first year of egg stamping the Productivity Commission estimated the cost per dozen eggs to be 9.8 cents while the survey showed that the NSW experience was between 2 cents and 4 cents per dozen. The median cost per dozen in the first year by all businesses using automated stamping equipment was 3 cents per dozen. Ongoing costs for medium sized business were estimated by the Productivity Commission at 2.7 cents per dozen each year compared to the NSW experience which shows this is closer to 1 cent per dozen. All egg producers who were stamping their eggs by automated equipment the median cost per dozen eggs for maintenance after the first year was 1 cent per dozen.

The survey did not sample any farms which fitted the small farm definition used by the Productivity Commission of approximately 60,000 dozen eggs per year. Small egg producers who were hand stamping eggs had production rates which varied between 119 and 260,000 dozen per year. Due to this variability, results from all small egg producers that are hand stamping, have been used in Table 6. The results show that in the first year the cost of egg stamping is close to zero as many of the egg stamps were provided free of charge. In subsequent years the cost of egg stamping is 1 cent per dozen eggs.

Table 6. Cost comparison between Productivity Commission and 2016 egg stamping survey results

Farm size	Item description	2009 Productivity Commission cost estimates (Initial year)	2009 Productivity Commission cost estimates (Subsequent years)	2016 NSW egg producer survey results (Initial year)	2016 NSW egg producer survey results (Subsequent year)
Large farm (approx. 4 million dozen eggs pa with stamping machine)	Equipment cost and installation	$37,300	0	Due to the low numbers of large producers, and the variability of business models, costings have not been completed.	
	Running costs	$16,000	$16,000		
	Cost per dozen eggs	1.33c	0.40c		
Medium farm (approx. 300,000 dozen eggs pa with stamping machine)	Equipment cost and installation	$19,200-$21,300	0	$6,000 to $10,000	0
	Running costs	$8,000	$8,000	$1,250-$3,000	$1,250-$3,000
	Cost per dozen eggs	9.8c	2.7c	2c to 4c	<1c
Small farm (approx. 60,000 dozen eggs pa with hand stamping)	Equipment cost and installation	$640	0	0[17]	0
	Running costs	$640	$640	0	$36.00
	Cost per dozen eggs	2.1c	1.1c	0	<1c

[17] Results from all small farms hand stamping (119 to 260,000 dozen pa) – median data used due to high variability of the number of eggs produced in each business.

Egg stamping in other jurisdictions and overseas

All Australian states and territories are now enforcing the requirement for egg stamping through their legislation; however NSW and Victoria delayed implementation by two years until November 2014.

Since egg stamping is a national requirement under the Australia New Zealand Food Standards Code, all states and territories are obliged to give effect to the requirement; however states/territories have flexibility in allowing for exemptions as seen appropriate.

The egg stamping requirement has been amended by some states and territories. States or territories where eggs are not produced in large volumes adopted the Standard initially; however amendments were made later to allow for some exemptions. Victoria exempts egg producers with 50 layers or less from stamping their eggs. Tasmania provides exemption to hobby farmers and small holders with less than 20 layers from stamping their eggs if the eggs produced are for personal consumption or given to family or work colleagues. Queensland, Western Australia, South Australia, Northern Territory and ACT do not provide any legislative stamping exemptions based on volume or how the eggs are sold. The Table 7 gives an overview of all jurisdictions in Australia and their egg stamping regulations.

Table 7. Egg stamping requirements in all Australian jurisdictions

Egg stamping requirements					
Jurisdiction	**Date**	**Legislation**	**Exemptions**[18]		
			Number of layers/or eggs	**Duck**	**Quail**
ACT	26 November 2012	*ACT Food Act 2001*	No	No	No
Northern Territory	26 November 2012	*NT Food Act 2004*	No	No	No
NSW	26 November 2014	*Food Act 2003* NSW Food Regulation 2015	< 240 eggs per week (< 50 layers) and; sell directly from farm gate or use it for fundraising purposes	No	No
Queensland	1 January 2005	*Food Production (Safety) Act 2000* Food Production (Safety) Regulation 2002 – Egg Scheme Egg food safety scheme for egg and egg products (1 January 2005)	No	No	No
South Australia	26 November 2012	Primary Produce (Food Safety Schemes) (Egg) Regulations 2012	No	No	No

[18] 50 layers approximates to about 240 eggs or 20 dozen eggs

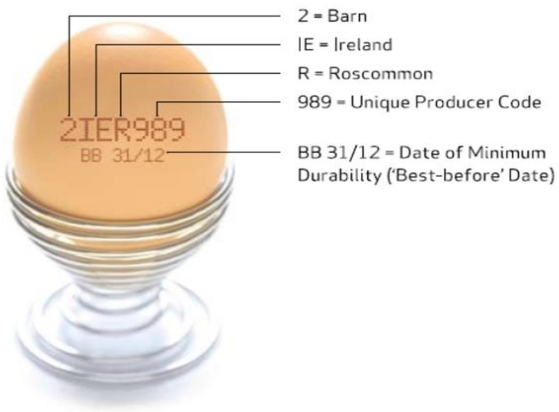
Egg stamping requirements					
Jurisdiction	**Date**	**Legislation**	**Exemptions**[19]		
			Number of layers/or eggs	**Duck**	**Quail**
Tasmania	1 February 2015	Primary Produce Safety (Egg) Regulations 2014 under *Primary Produce Safety Act 2011*	< 20 dozen (240) eggs per week and; supply eggs to work colleagues, friends, and family	No	No
Victoria	25 November 2014	*Victorian Food Act 1984*	< 50 layers (< 240 eggs per week)	Yes	Yes
Western Australia	26 November 2012	*WA Food Act 2008*	No	No	No

Egg stamping internationally

Egg stamping is a common practice in other countries. It is practiced in the European Union which has 28 member countries, Israel, and Singapore. Egg stamping has not been implemented in the United States.

Egg stamping in European Union

All the 28 European Union member countries are required to mark their eggs as provided in the picture below. The first number identifies the production system; “0” = Organic, “1” = Free range, “2” = Barn and “3” = Caged. The second set of code refers to the country of origin and the last set of letter or number system identifies the registered production site and the unique producer code. There are no legal requirements for the best before date to be stamped on the eggs, however many of the producers do stamp this information on the eggs to gain consumer loyalty.



A recent *Salmonella* Enteritidis related outbreak in 2014 involving five member states of European Union were linked to eggs from Bavaria. Egg stamping enabled for rapid trace-back investigations to identify where the eggs were from and further identified, in a timely manner, the countries the eggs were distributed to.

Egg stamping in other countries

All eggs sold in Israel must pass through a sorting station and be stamped. The four digit number on the egg (2741) is the code for the sorting station that the egg passed through. The first line is the name of the farm where the egg comes from. This egg has “L” for large and the stamp states the type of farming system used to produce the egg, in this case it is an organic egg. The first date 02.05, is the last day the egg can be sold, which is

[19] 50 layers approximates to about 240 eggs or 20 dozen eggs

16 days from the sorting date. The second date 01.06, which is 30 days after the first date, is the egg's expiration date assuming it was stored in the refrigerator. The reason there are two dates is because the eggs are stored in the supermarket at 20°C and at home in a refrigerator. Imported eggs to Israel have letter codes stamped on the eggs, e.g. Netherlands (NL), Spain (ES) and Turkey (TR)[20].

In Singapore egg farms under the Singapore Quality Egg Scheme now have to implement a system that allows them to trace and recall produce quickly. This involves farmers stamping their eggs with their farm's code and the production date on the eggs[21].

United States

The United States of America does not require egg producers to stamp their eggs however egg traceability is captured under the *Fair Packaging and Labelling Act* (15 U.S.C. 1451et seq.). Eggs supplied to consumers need to be packaged in containers with appropriate labelling identifying the manufacturer of the egg, best by or use by date, size, grade, quantity.

In 2010 there was a major egg related foodborne illness outbreak in US. There were a total of 3,578 illnesses, spread across 11 states, related to *Salmonella* Enteritidis (SE) reported from 1 May to 30 November 2010. The source of the outbreak was linked to 29 restaurants where more than one person with the identified bacterium had eaten.

Trace back investigation implicated two farms from Iowa State responsible for the outbreak. The US Food and Drug Administration (USFDA) completed inspections of the two farms and concluded there was a high potential for *Salmonella* to have persisted in the farm environment thereby contaminating the eggs. Upon further investigations, the probable source of contamination was identified as the feed distributed to the two farms.

More than 500 million eggs were recalled from the two Iowa farms that distributed eggs to 15 U.S states. Of the 3,578 reported illnesses, approximately 2,000 were linked to the eggs.

Despite egg related foodborne illness outbreak concerning *Salmonella* Enteritidis, the United States has not adopted egg stamping as a traceability tool to expedite the process in finding the source of the outbreak. However, the US FDA issued a final rule *Prevention of Salmonella* Enteritidis *in Shell Eggs during Production, Storage and Transportation*[22]. This rule imposes a requirement on egg farmers to maintain a written SE prevention plan that includes mandatory flock based SE testing on egg farmers, mandatory shed disinfection procedures between introducing new layers should a positive SE detection arise in sheds, mandatory refrigeration control through the transportation and supply chain so that eggs, within 36 hours of lay are kept at no greater than 7ºC.

[20] https://couponingintheholyland.wordpress.com/2013/08/08/aliyah-tip-1-understanding-eggs/

[21] https://www.facebook.com/notes/wwf-singapore/buy-more-local-produce-its-fresher-ava/10150213021808176/

[22] https://www.gpo.gov/fdsys/pkg/FR-2009-07-09/pdf/E9-16119.pdf

Actions to improve implementation of egg stamping for industry

The Food Authority formally consults with the egg industry twice per year via the Egg Industry Consultative Committee (EICC). The Food Authority has also completed three egg industry surveys about egg stamping in order to understand the issues and assist the egg industry. The first survey was completed in 2011 prior to the introduction of the national Standard, the second survey in 2014 just prior to the introduction and the third in 2016, 12 months after the introduction of egg stamping. These surveys along with input from the EICC have provided the Food Authority with good quality information on how to implement change to the egg industry.

The EICC is established under section 105 of the *Food Act 2003* for informing on matters relating to the Egg Food Safety Scheme including the operation of the scheme and any proposed amendments to the Scheme, prior to undertaking broader industry consultation. The membership of the EICC has representatives from different industry sectors, such as large and small scale egg producers, egg processors and free range eggs producers.

Egg stamping has been an issue under discussion since the committee's inception in 2012. Considerable discussion was held and concerns raised by members on behalf of their constituents. Ongoing costs were listed as a concern for small scale egg producers. The Food Authority provided hand egg stamps to small producers free of charge to address these concerns.

The EICC reported unexpected benefits as a result of egg stamping. For example, stamping has allowed misleading practices to be detected and addressed. In one instance cage eggs sold at a rural market as free range could be correctly identified by the egg stamp.

Generally there was good support for egg stamping from EICC members with one exception. One small scale egg producer's representative said that although the small producers were stamping their eggs, they still could not see the necessity and that adequate traceability existed through cartons and invoice documents.

In order to assist the egg industry with the costs of implementing egg stamping and general regulatory burden on small business, the Food Authority initiated the following practices:

1. The time to implement egg stamping was delayed by two years to allow producers to prepare and budget for the changes.
2. The supply of a free hand egg stamp and five ink refills to small volume egg producers, to offset implementation costs. A total of 850 egg hand stamps have been issued to licensed egg producers and processors and to unlicensed small scale egg producers across NSW. These stamps were purchased from a Victorian company. The stamps come with an integrated ink pad and approximately 20,000 eggs can be stamped before the ink needs to be refilled. For a small egg business (less than 240 eggs in any week), this is sufficient supply for 18 months of trading. Some of these larger producers have received hand stamps as a back-up system in case their automatic systems fail. The total cost of the stamps from 2013-2015 to the Food Authority has been $22,496.50. Given increasing numbers of licensed egg producers, and the change in egg producers over time, it is likely that the demand for egg stamps will continue into the future.
3. A licence fee waiver was introduced for licensed egg businesses that do not produce more than 100 dozen eggs in any week. The fee waiver included the one off licence application fee cost of $50.00 and the annual licence fee. The annual licence fee for 0 to 5 FTE food handlers is $441.00[23] and from 6 to 50 FTE food handlers is $910.00. This fee waiver has reduced the cost to the egg industry by $154,894.00. This is an

[23] Licence fees at July 2015

annual saving for each small volume egg producer of $441.00 for the 2014-2015 year. It is estimated that a total of 66 licensees will received the fee waiver in the 2015-2016 year, which is 25%[24] of all egg production licenses.

4. A policy was also introduced to allow egg businesses to report equipment failure to the Food Authority within 24 hours and seek exemption from egg stamping for a specified period of time, until the equipment is repaired. The egg industry was concerned that if automated egg printers broke down this would stop producers from being able to sell eggs as it is an offence to supply unstamped eggs. Following a review of the request and decision on validity, the Food Authority sends the producer a formal response agreeing to a temporary exemption with the date stipulated whereby stamping will re-commence. If the business requires a further extension, another exemption can be requested. If egg businesses are later asked why their eggs are not stamped they can show the letter of exemption as evidence they were granted temporary exemption by the Food Authority. From November 2014 to November 2015, 18 businesses have reported equipment failure 37 times.
5. Compliance with egg stamping for licensed businesses was monitored through routine Food Authority audits. Non-licensed egg businesses requiring egg stamping were monitored through targeted point of sale inspections conducted by the Food Authority and local government officers at market stalls and retail premises. For the period 1 July 2014 to the 31 December 2015, there were 177 audits undertaken on licensed egg production and processing businesses. Two licensees were found to be not complying with egg stamping. On follow-up audits one licensee had complied and one had not and because of this issue and other issues, the business was closed until the problem was solved.

The compliance work demonstrated that the majority of egg producers were complying with egg stamping requirements. Most store holders at farmers markets selling eggs were aware of egg stamping requirements and were either in receipt of free egg stamps from the Food Authority or obtained eggs from suppliers that were stamping their eggs.

There have been minimal complaints about compulsory egg stamping since its introduction. Two emails were received from concerned readers who questioned the relevance of egg stamping following publication of an egg stamping article in The Land newspaper in 2014, however neither correspondent produced eggs. No complaints have been received through the Food Authority helpline about egg stamping since its introduction.

[24] 10.08.2015 byte database licence data 66 out of 263 egg licensees.

Literature review on the efficacy and cost effectiveness of egg stamping or similar programs

The international and national literature review did not provide much information on the efficacy and cost effectiveness of egg stamping or on similar programs. Even though the European Union member countries had implemented egg stamping in 2004, there are no reports available in the public domain that presents the cost effectiveness or efficacy of the program. Documents that assess the cost impact of egg stamping are FSANZ's 2011 Regulatory Impact Statement (RIS) developed in support of Standard 4.2.5 and the Productivity Commission's 2009 report on performance benchmarking of Australian and New Zealand business regulation which included egg stamping[25].

Both the FSANZ RIS and the Productivity Commissions report referred to the Queensland experience of implementing egg stamping as it was the only jurisdiction that required egg stamping by law at that time. The figures used for equipment cost for small, medium and large egg producers and the associated ongoing costs for egg stamping in FSANZ's RIS were based on Queensland's experiences and data provided by the Victorian Department of Primary Industries.

Consultation with economists from NSW Department of Primary Industries Strategy & Policy Branch to seek literature sources on similar program costs, efficacy and cost-effectiveness provided no additional resources that are comparable to the costs associated with egg stamping. Advice was that due to the nature of the costings, industries involved in individual package labelling do not disclose the information publicly due to concerns about competitors accessing this information.

The most recent data on egg stamping is contained in the Food Authority's recent survey of licensed egg businesses.

Egg stamping adoption at markets and retail venues

In early 2015, the Food Authority conducted a compliance project targeting NSW markets. A total of 103 inspections were conducted in 18 different market locations. Ten locations sold eggs and a total of 19 inspections were conducted at these sites. Four inspections detected unstamped eggs and another 3 inspections found egg labelling issues including one instance where labelling present on recycled egg cartons did not match the origin of the eggs inside the cartons. Four warning letters were issued as a result of this project and follow-up inspections revealed that all identified businesses subsequently complied with egg stamping requirements.

Importantly, this work provides an excellent example of a situation where egg stamping can ensure that traceability is maintained no matter how eggs are repackaged in retail environments.

Egg stamping is also checked at retail venues during routine food safety inspections of retail food businesses conducted by local council Environmental Health Officers (EHOs). The Food Authority engages with EHOs regularly to consult on food safety matters and to provide training as part of the NSW Government's Food Regulation Partnership with local councils. Feedback on compliance with egg stamping requirements from EHOs is very good. The main discrepancy observed by EHOs relates to failure of stamping equipment to properly stamp every egg in some cartons. This is one of a number of stamping equipment issues that the Food Authority will discuss with the egg industry.

[25] http://www.pc.gov.au/inquiries/completed/regulation-benchmarking-food-safety/report

The supermarkets understand and support requirements for egg stamping and the prohibition on sale of dirty eggs. Supermarkets will not accept eggs from suppliers unless they comply with these requirements.

Prevalence of dirty eggs following egg stamping

Egg stamping does not guarantee that cracked or dirty eggs will not reach the market, however it provides traceability to be able to identify the producer of the dirty eggs that is not meeting the requirements of the Standard. The producer can then be held accountable.

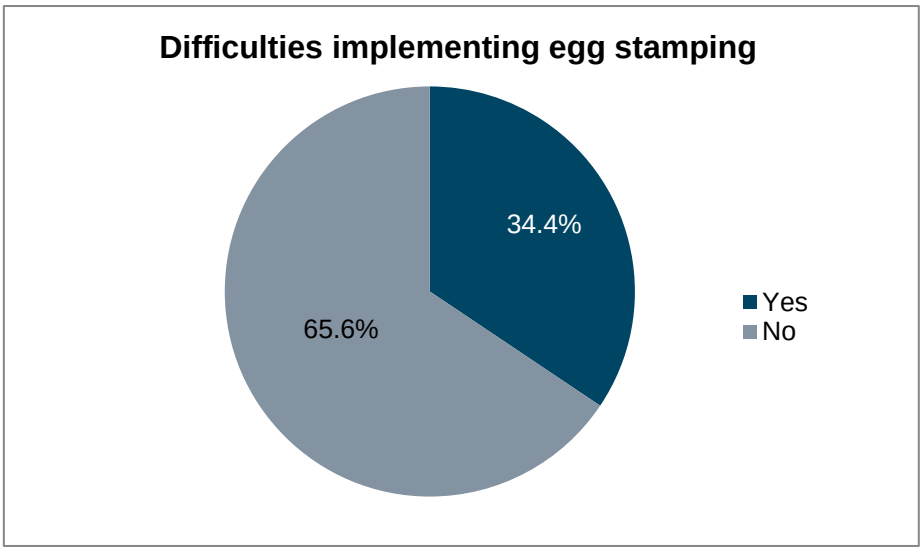
The sale of dirty eggs has been prohibited in NSW since 2010, and is specifically prohibited by national Standard 4.2.5 in a separate clause to the traceability clause. Markets and retail venues are routinely inspected by the Food Authority and local councils. Eggs are checked for stamps, cracks and cleanliness (dirt) at these venues as part of the inspection process. The targeted survey of markets also checked for cracked and dirty eggs.

The compliance inspections outlined above involved 103 inspections at 18 market locations in NSW. This work identified one vendor at one location offering eggs for sale that were slightly soiled with feathers and dirt. This vendor was provided with advisory information on the importance of offering clean, intact eggs for sale. As the eggs were only slightly soiled, no follow up inspection was required.

Outstanding egg stamping issues to be addressed

The 2016 survey of egg producers asked if they had experienced any difficulties implementing egg stamping. Two thirds of egg producers had not experienced difficulties (66%) and a third (34%) had experienced difficulties.

Figure 5. Difficulties of egg stamping



When egg producers were asked to describe the issues, most were related to automated equipment failure or ink quality. Seventeen egg producers who were using egg stamping equipment said that they were having ongoing, frequent issues with the equipment breaking down. Producers living a long distance from Sydney said that it was costly to get someone to come and service their machines and that it was cheaper to send the machines back to Sydney on a truck than to pay for someone to travel to them. Only one producer said that his machine was purchased second hand. Most producers had purchased the equipment new.

The issue of automated egg stamping machinery breaking down and the impact this is having on time and money costs to businesses was of concern for a number of producers. This is of particular concern as the equipment is new and it is likely that equipment breakdowns will increase over time as equipment ages. Further investigation into the cause of equipment breakdown is needed. Some producers have requested that more information and guidance be provided on maintenance and purchase of stamping equipment.

Conclusion

Egg stamping was introduced as part of the Australia New Zealand Food Standards Code national Standard 4.2.5, with the objective of improving the traceability of eggs and the ultimate goal of reducing the impact of foodborne illness outbreaks. Egg related foodborne illnesses are frequent in Australia and the number of people hospitalised is high compared to other foodborne related illnesses.

12 months on, egg stamping has been widely adopted across the whole NSW egg industry including both licensed and unlicensed egg producers and processors. The Food Authority has successfully communicated with all egg producers and processors and now has a database with over 935 egg stamp records.

The review found that egg traceability has improved due to egg stamping. An investigation of an egg related foodborne illness outbreak was conducted and the egg stamp led to faster identification of the producer concerned. This rapid trace-back has very likely reduced the impact of this incident. The egg stamp was then used in the egg recall process so that consumers could identify easily the recalled eggs. Producers have also stated that they have found it useful to be able to identify their own eggs in case recycled packaging is used or if eggs are comingled.

Although there were a number of complaints, submissions and concerns raised about egg stamping prior to its implementation, there have been few complaints since its introduction in NSW. The issues raised in the two years prior to implementation enabled the Food Authority to work with industry to address them early on.

The cost of implementing egg stamping for NSW producers was determined to be less than that forecast by the Productivity Commission in 2009, prior to the national implementation of egg stamping. For medium sized businesses, costs per dozen were nearly one third of that predicted by the Productivity Commission at 2-4 cents per dozen eggs, and small sized businesses typically incurred no costs in the first year (due to the Food Authority providing free hand egg stamps on request) and 1 cent per dozen eggs in subsequent years. Costs for large businesses were not calculated as these businesses were voluntarily stamping for commercial reasons.

Most businesses also reported that stamping was taking less than 30 minutes per day, with the exception of duck and quail eggs. These eggs were reported as taking up to 3 hours a day, particularly quail eggs where shell fragility, colour and size are unique factors.

Overall, the introduction of egg stamping in NSW has met its objective and has improved traceability of eggs across NSW as well as traceability for individual businesses. Egg businesses are complying with stamping and a quarter of respondents in the survey reported benefits from improved traceability through stamping. Producers have also reported unexpected benefits of egg stamping including detection of misleading practices in the marketplace. One producer reported that his caged eggs were being sold as free-range eggs at a local country market. The egg stamp allowed his eggs to be identified as cage eggs and he was able to stop this practice from occurring.

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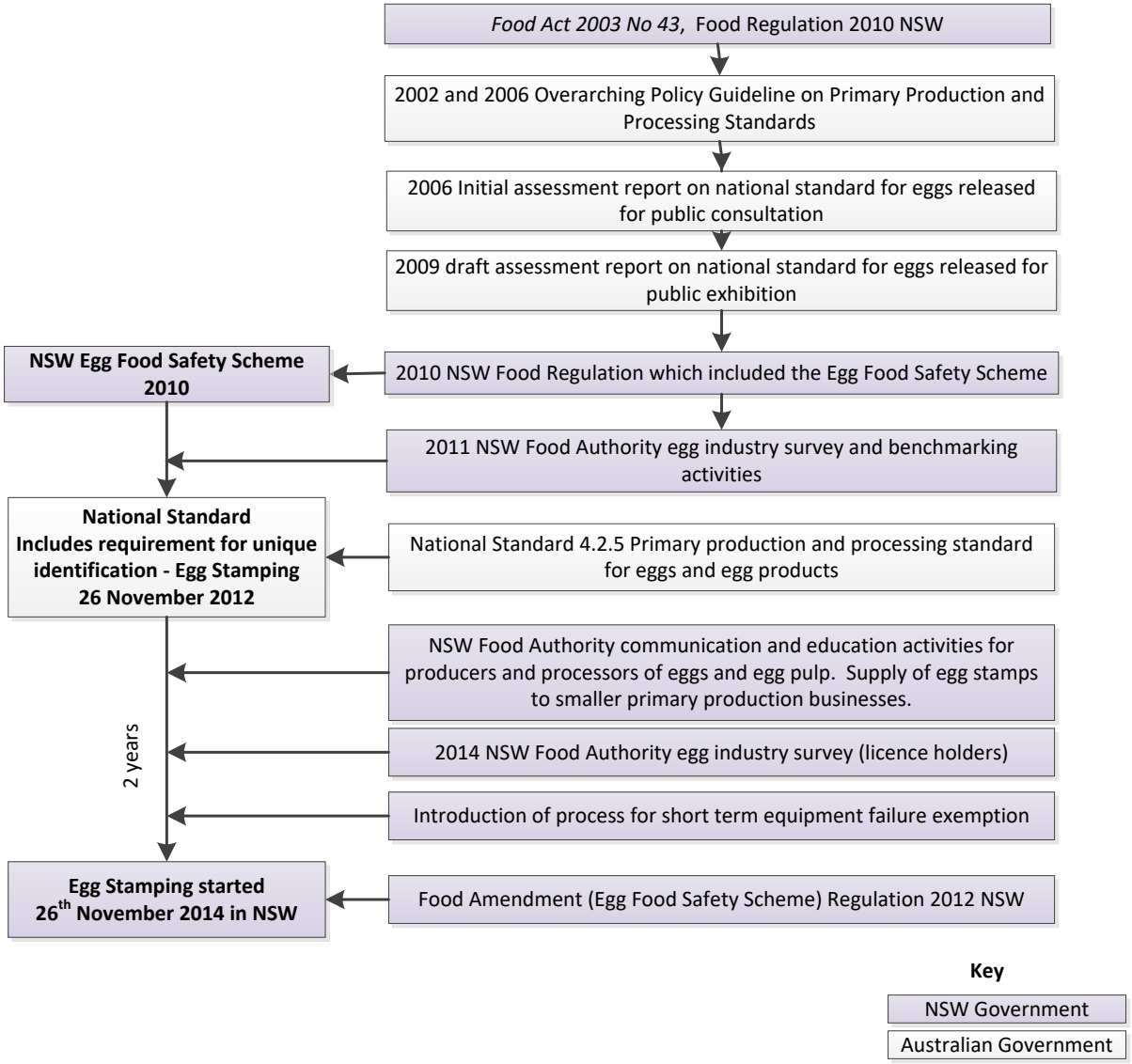
Appendix 1: Timeline – regulation and implementation of egg stamping



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