

# Guidelines for Egg Cleaning Procedures

Guidelines for businesses carrying out egg cleaning procedures to ensure that food safety risks are minimised.



April 2015

## Contents

Introduction .....	3
Egg collection .....	4
Egg collection for small farms.....	4
Egg collection on larger scale farms.....	4
Egg cleaning.....	5
Documentation requirements of egg producers and graders .....	6
Records.....	7
Egg processing environment.....	7
Requirements for pre-wash, wash, and rinse water .....	7
Pre-washing .....	8
Washing .....	8
Sanitising .....	9
Rinsing .....	9
Drying .....	9
Verifying the cleaning method.....	10
Notifying Safe Food Production Queensland .....	10
References .....	11

## Introduction

Queensland's Egg Food Safety Scheme reflects the requirements provided for under Standard 4.2.5 Egg and Egg Products of the Australia New Zealand Food Standards Code ( 'the Standard' ). Under the Standard, an egg producer must not sell or supply eggs or egg pulp for human consumption if the eggs are unacceptable.

An unacceptable egg is:

- a) A cracked egg or a dirty egg; *or*
- b) An egg which does not have a unique identifier stamped on it; *or*
- c) An egg product that has not been processed in accordance with the Standard.

Egg businesses that produce and wash or clean and grade eggs for human consumption must also implement appropriate cleaning procedures to manage the safety of their product.

Dirty eggs can be a health hazard if they are not handled correctly. Dirty eggs can carry harmful bacteria that can enter the eggs, and if not cooked properly, they can potentially cause food poisoning. This risk is increased if the eggs are cracked.

Dirty eggs must not be sold.

Dirty eggs must be either:

- Cleaned so that visible faeces, soil and other matter (e.g. feathers, nesting material, shell, yolk) is removed from the shell; *or*
- Supplied to an accredited egg business that washes, dry cleans or further processes eggs; *or*
- Discarded in an appropriate manner.

## Egg collection

### Egg collection for small farms

Eggs should be collected often, at least once per day, to help decrease the number of dirty and broken eggs. The collection of eggs should be more frequent during very hot and cold weather.

Important points to remember when collecting eggs:

- Clean eggs should be separated from dirty eggs.
- Excessively dirty eggs should be discarded.
- Eggs should be collected in an easy to clean container like coated wire baskets or plastic flats. This will prevent stains from rusted metal and contamination from other materials that are difficult to clean and sanitise.
- Do not stack eggs too high. If collecting in baskets, do not stack eggs more than five layers deep. If using plastic flats, do not stack more than six flats.
- Eggs should be kept below 15°C prior to cleaning.
- Eggs should be graded and washed on the day of collection to avoid the growth of microbial contaminants, particularly on cracked and dirty eggs. This can have the added benefit of reducing the amount of microbial contaminants entering the egg grading/washing system.
- Never cool eggs rapidly before cleaning. The eggshell will contract and may pull any dirt or bacteria on the egg surface into the pores when cooled.
- To minimise sweating, keep egg temperatures constant until the eggs are processed, graded or cleaned.
- Sweating occurs when eggs are moved from cold storage to a warm environment and condensation on the surface of the egg facilitates movement of microbes to the inside the shell.

### Egg collection on larger scale farms

Depending on the farm size and design, different methods can be used for daily egg collection. Large operations generally employ custom made, highly automated egg collection systems. Regardless of the scale of operation, all egg businesses should address the above guidelines.

## Egg cleaning

Safe Food Production Queensland (SFPQ) does not mandate the washing of eggs. The management of dirty and otherwise unsuitable eggs is at the discretion of each egg business.

While washing can remove physical contaminants and markedly reduce the amount of microbes on the surface of the shell, if not done correctly, washing can increase the public health risks associated with the handling and consumption of eggs. For example, washing can potentially remove the cuticle of the eggshell and unsuitable wash water temperatures can cause the inner contents of the egg to shrink. Under these conditions, wash water and pathogens can potentially be drawn into the egg through the pores of the shell. Washing dirty eggs can also place considerable strain on the egg washing system, and if not appropriately managed, can make it difficult to produce suitable eggs. If an egg business chooses to wash eggs, the activity must be approved by SFPQ and effectiveness of the method must be validated.

Businesses that choose to wash eggs should:

- Wash eggs as soon as they are collected - this will help limit the opportunity of contamination of the egg and the egg grading/ washing system.
- Separate excessively dirty eggs from other eggs prior to washing and discard them.
- Wash water should be held at 41-44°C and if using an egg washing chemical or sanitiser the pH should be  $\geq 10.5$ .
- Use chemicals in the wash and sanitising steps that are complementary (e.g. both should be basic solutions).
- Ensure the concentration and pH of the wash and sanitiser water is regularly monitored and maintained at appropriate levels in accordance with the manufacturer's recommendations.
- Ensure if bore water is in use its mineral content is tested regularly and managed appropriately so not to interfere with the activity of sanitisers (e.g. must contain less than 2 ppm iron).
- Know that if using appropriate temperature water, without any chemicals (detergents or sanitisers) and the water is not recirculated, the pH of the water does not have to be taken into consideration.

- Ensure the washing process is continuous so that eggs are not allowed to stand or soak in the wash water.
- Dry the eggs after washing. If eggshells are left wet the risk of microorganisms entering the egg is increased.

SFPQ strongly advises against re-washing eggs that emerge from the washing process carrying faecal matter or other visible contaminants on the shell. Such eggs should be discarded.

Dry cleaning procedures are permissible. However, prior to implementation the procedure must be discussed with SFPQ and be validated as being suitable to control food safety hazards. Any egg cleaning process that is undertaken should not compromise the safety of eggs.

### Documentation requirements of egg producers and graders

Egg producers/graders that wash eggs must have a documented procedure for this process to ensure that contamination from the wash water is minimised.

This procedure should outline the:

- Temperature of the water to be used at all stages of the washing process (e.g. wash, sanitise and rinse) with appropriate temperature differentials observed. For example, in a three-stage wash process the water should be:
  - Wash water ( $41^{\circ}\text{C} \pm 3^{\circ}\text{C}$ )
  - Sanitising water ( $45^{\circ}\text{C} \pm 3^{\circ}\text{C}$ )
  - Rinse water ( $49^{\circ}\text{C} \pm 3^{\circ}\text{C}$ )
- Concentration of sanitisers (chlorinated or other) and or detergents (food grade).
- pH of the wash water with any kind of added sanitiser or wash chemical ( $\text{pH} \geq 10.5$  to be obtained).
- pH of reticulated wash water (a pH of  $\geq 10.5$  must be obtained to control growth of microorganisms like Salmonella).
- Corrective action for noncompliance with the washing temperatures, concentrations or pH values.
- Egg drying process.

There are a number of different chemicals available for use in egg washing systems. Egg businesses should ensure that chemical concentrations are monitored and maintained within the manufacturer's recommended range. SFPQ strongly encourages egg businesses to engage with their chemical suppliers to ascertain this information.

## Records

The temperature, chemical concentration and pH of the water at all stages of the washing process should be recorded for each batch of eggs washed. SFPQ also recommends recording the number of eggs that enter the grading system, the number of eggs that are broken or discarded during processing and the number of eggs that are packed for supply.

## Egg processing environment

Egg washing should be undertaken in a dedicated room with good drainage. There should not be any pest infestation, and a recognised pest control program should be in place. All egg processing equipment should be thoroughly cleaned and sanitised, as needed, to prevent the accumulation of egg material and microbes.

Immersion egg washers are not prohibited however, to mitigate the risk of potential egg contamination, SFPQ encourages that they are not used.

## **Requirements for pre-wash, wash and rinse water:**

- All water supplies should ideally be of potable quality.
- Only soft water should be used and a suitable softener should be used in hard water areas.
- If non-reticulated water is used in washing of eggs, it must be tested in accordance with your approved food safety program.
- Businesses wanting to use recycled water are required to apply in writing to SFPQ. Applications will be considered on a case-by-case basis.
- Businesses that use a non-reticulated water supply and treat the water with chlorine or another suitable method should test this water daily for residual chlorine levels and maintain records of the water treatment. This information should be made available for review by SFPQ.

## Pre-washing

Dirty eggs can go through a pre-washing process to loosen dirt and faecal matter, before being washed. However, excessively dirty eggs should be appropriately discarded.

When pre-washing, it is important to ensure:

- Pre-wetting should be accomplished by spraying a continuous flow of water over the eggs in a manner that permits the water to drain away.
- The temperature of the water should be at least 11°C higher than that of the eggs and a minimum of 3°C lower than that of the wash water.
- Eggs are held where drainage of spray water is free, as the eggs cannot stand or soak in the water.
- Washing starts immediately afterwards.
- The pre-wash water is not reused.

## Washing

Eggs need to be washed in water that is at least 11°C higher than the temperature of the warmest egg. This will make the egg contents swell and push the dirt away from the pores of the egg.

During egg washing:

- Eggs should be washed only once, except for any pre-wash that may be used.
- Wash water temperature should be between 41–44°C.
- PH of incoming wash water can be between 6.1 to 6.7, however if the wash water is recirculated, the pH should be maintained at  $\geq 10.5$  to control growth of Salmonella.
- Solutions should be changed regularly, at least every 4 hours for continuous operations.
- Eggs should not be allowed to stand or soak in water; once the temperature equalizes eggs can absorb contaminants out of the water.
- The pH of recirculated wash water and temperature of the water at all stages of the washing process should be recorded for each batch of eggs washed.
- If you have dirty eggs, a mild detergent approved for washing eggs can be used.

## Sanitising

Chemicals for cleaning and sanitising eggs should:

- Be incorporated in the wash and final rinse solutions.
- Follow manufacturers recommended concentration and pH.
- Effectively remove microorganisms from the eggshell.
- Not damage the eggshell.
- Not affect the texture or taste of the eggs before or after cooking.
- Be easily rinsed off so does not leave any residue.
- Have a neutral or alkaline pH (acidic solution destroys eggshell).
- Be compatible with water supply.
- Be safe and suitable for contact with food.

## Rinsing

Final rinsing procedure removes the residue of any chemicals and loose dirt adhering to the surface of the shell.

When rinsing it is important to note:

- Rinse water should be a few degrees higher than the wash water to prevent drawing of water into the egg; *and*
- rinse solutions should not be re-circulated.

## Drying

- Eggs should be promptly and thoroughly dried after rinsing and prior to packing. Drying can be achieved with high-speed airflow that causes water to evaporate from the shell surface.
- Air could be warmed or dehumidified.
- Eggs should be stored between 5°C and 15°C under clean and dry conditions with their broad pole uppermost.
- Condensation on the eggs should be avoided.

## Verifying the cleaning method

Any egg business that chooses to clean eggs must verify on a regular basis that their cleaning procedure is suitable to control food safety hazards. SFPQ recommends that this process be done at least once a year. All businesses must notify SFPQ of any changes to procedures regarding the management of unacceptable eggs, including the introduction of washing or any change to a validated washing method.

## Notifying Safe Food Production Queensland

It is a condition of accreditation that food businesses notify SFPQ if the holder of accreditation knows or reasonably suspects that product intended for supply is subject to a circumstance that makes the product unacceptable. This includes a failure of systems that manage otherwise unacceptable eggs (e.g. the egg washing system) or that fulfil a critical task within the process that relates to compliance (e.g. egg stamping). Furthermore, SFPQ must be notified if a change is made to the food safety system, particularly when the change relates to a critical control point (e.g. changes to egg washing procedures).

## References

AECL. Code of practice for shell egg production.

<http://www.aecl.org/assets/Uploads/Resources/Code-of-Practice-for-Shell-egg-production-grading-packing-and-distribution-2009.pdf>

ATTRA – is funded under a grant from USDA rural business cooperative service.

CODEX. [www.codexali http://www.fao.org/docrep/012/i1111e/i1111e01.pdf](http://www.fao.org/docrep/012/i1111e/i1111e01.pdf)

EFSA. Opinion of the scientific panel on biological hazards on the request from the Commission related to the microbiological risks on washing of table eggs.

<http://www.efsa.europa.eu/en/scdocs/doc/269.pdf>

Health Canada [http://www.inspection.gc.ca/food/eggs-and-egg-](http://www.inspection.gc.ca/food/eggs-and-egg-products/manuals/shell-egg/chapter-18/eng/1375380670241/1375380672147#a18.10)

[products/manuals/shell-egg/chapter-18/eng/1375380670241/1375380672147#a18.10](http://www.inspection.gc.ca/food/eggs-and-egg-products/manuals/shell-egg/chapter-18/eng/1375380670241/1375380672147#a18.10)

and <http://www.inspection.gc.ca/food/eggs-and-egg-products/manuals/shell-egg/chapter-3/eng/1376678096775/1376678147114#a363>

NSW Food Authority. Egg cleaning procedures: Guidelines to comply with the egg food safety scheme of the Food Regulation 2010

USDA. Egg Grading Manual.

<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELDEV3004502>