

Eggs & Salmonella

the
facts
2016

Runny eggs set to go back on the menu for young and old



A report by Government food safety advisors, published in January 2016, has concluded that British Lion eggs can safely be eaten runny, even by pregnant women, babies and elderly people. The report recommends that the Food Standards Agency (FSA) should now consider amending its long-standing advice – that vulnerable groups should avoid raw or lightly cooked eggs - for eggs produced under the British Lion scheme or a demonstrably-equivalent comprehensive scheme.

A specialist sub-group of the Advisory Committee on the Microbiological Safety of Food (ACMSF) conducted a year-long review to assess improvements in UK egg safety since its last review in 2001. It concluded that the very low risk level means that eggs produced under the Lion Code can be served raw or lightly cooked to all groups in society.

Around 90% of UK eggs are now produced under the Lion Quality scheme.

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ACMSF praises uk progress on salmonella

The ACMSF's report (*An update on the microbiological risk from shell eggs and their products*) acknowledged the 'significant efforts' undertaken by the UK egg industry to reduce *Salmonella* Enteritidis in laying flocks, which it says has made a 'remarkable impact' in reducing the levels of *S. Enteritidis* infections in humans.

It concluded: 'There has been a major reduction in the microbiological risk from *Salmonella* in UK hen shell eggs since the 2001 ACMSF report. This is especially true for those eggs produced under the Lion Code, which comprises a suite of measures including: vaccination, a cool chain from farm to retail outlets, enhanced testing for *Salmonella*, improved farm hygiene, better rodent control, independent auditing, date stamping on the eggs and traceability.'

It considered that: 'The very low risk level means that eggs produced under the Lion Code, or produced under demonstrably equivalent comprehensive schemes, can be served raw or lightly cooked to all groups

in society, including those that are more vulnerable to infection, in both domestic and commercial settings, including care homes and hospitals.'

The ACMSF's investigation builds on previous reports from the Food Standards Agency (FSA) and the Health Protection Agency (HPA), now Public Health England, which praised the British egg industry for the huge decline in *Salmonella* associated with eggs, contrasting with an FSA survey of non-UK eggs on sale in the UK, published in 2006, which found egg shell and/or contents contamination in one in 30 boxes of six eggs sampled.

In 2013 Edwina Currie, speaking 25 years after her comments triggered the *Salmonella* in eggs crisis, said: "The producers concerned have made an enormous amount of effort to ensure that their laying flocks are clean, that they're vaccinated, and they have a testing regime which I think is second to none. You can have your soft-boiled egg today, in Britain, provided it's got a little Lion on. It's safe."

lion code of practice

The wide-ranging Lion Code is a unique food safety scheme, which covers the entire production chain, incorporating more than 1,100 laying farms and 60 packing stations. The latest version, published in 2013, incorporates a range of food safety controls above and beyond those outlined in current UK and EU legislation, including:

- All Lion hens and eggs guaranteed British
- Hens vaccinated against *S. Enteritidis* and *Salmonella* Typhimurium
- Registration and a unique 'passport' system, ensuring complete traceability of hens, eggs and feed
- Increased hygiene controls and salmonella testing of all flocks in the integrated egg production chain, in excess of the National Control Programme, including turnaround

swabbing of breeding, pullet rearing and laying flocks; and packing centre hygiene swabbing

- Regular egg testing (not included in National Control Programme)
- Stringent feed controls, including production of feed to Universal Feed Assurance Scheme (UFAS) standards
- Lion Quality eggs stamped on farm with the farm code and production method
- Best-before date and Lion logo printed on the shell of Lion Quality eggs as well as on the egg box
- Regular independent auditing, including unannounced audits, of all producers and packers in the Lion scheme, in accordance with the ISO 17065 standard.

egg grading

Eggs are graded at the packing station for quality and size.

Only Class A eggs are sold fresh for human consumption. These eggs have a normal, clean, intact shell; an air cell not exceeding 6mm in depth; a clear, translucent, gelatinous egg white, free of foreign substances; and a stationary yolk which is visible under candling as a shadow only and which is free from foreign substances. The egg should be

free of all foreign odours. Washing or other cleaning of Class A eggs is not permitted.

Class B eggs are those which do not meet the standards for Class A eggs. Class B eggs cannot be sold by retailers, nor used by caterers. Class B eggs must only be sent for processing by premises approved by local authorities to manufacture egg products, or may be sold to non-food manufacturers.

printing on eggs

All Class A eggs have to be marked with a code showing the type of farming system, country of origin and production unit.

In addition, Lion Quality eggs have a best-before date on the shell and carry the Lion logo.

Farming Method

- 0 = Organic
- 1 = Free Range
- 2 = Barn
- 3 = Cage

Country of Origin

e.g UK



Additional standards for Lion Quality eggs

Lion Mark

British eggs from hens vaccinated against *Salmonella* and produced to a strict Code of Practice

Best Before Date

Farm ID
A specific code denoting the actual farm where the eggs were produced

poultry & egg borne salmonellosis

By Tom Humphrey, Professor of Bacteriology
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There are approximately 2,600 known serotypes of salmonella but the most important type in human infection worldwide is *Salmonella* Enteritidis (SE).

During the late 1980s there was a sharp increase in the occurrence of SE worldwide. Investigations implicated poultry as a source and poultry meat and shell eggs as food vehicles.

SE is invasive in poultry and can cause clinical disease resulting in death in young chicks and pericarditis and perihepatitis can sometimes be seen in broiler carcasses examined at slaughter, although this bacterium is currently only very rarely isolated from UK poultry, and levels of infection in hens and people are declining across Europe.

The public health importance of SE is related to the fact that the organism can be isolated from the contents of intact shell eggs and it has been demonstrated that reproductive tissue can be infected.

Production of infected eggs by hens carrying the organism is sporadic - experimental work by the Public Health Laboratory Service (PHLS) in 1989 showed that only around 1% of all the eggs from a known infected flock contained *Salmonella*, with less than 3% of the eggs of individual infected hens found to be contaminated.

In addition, the number of bacteria in each infected egg at lay was very low, at around 10 cells.

Investigations of naturally contaminated eggs also showed that all those examined when fresh contained fewer than 20 organisms. This is unlikely to be a sufficient dose to cause an infection in most humans. However, naturally contaminated eggs with large populations of SE in their contents have been reported, albeit very rarely.

The chances of an individual becoming infected from a single egg are very small indeed if the egg is correctly handled, and the risk has been markedly reduced by the Lion Code salmonella vaccination policy.

The principal site of contamination in egg contents appears to be either the outside of the yolk membrane or the albumen surrounding it. The yolk membrane becomes more permeable during storage and growth of SE, associated with invasion of yolk contents, can occur when eggs are stored at 20°C for more than three weeks.

egg handling advice

According to the Advisory Committee on the Microbiological Safety of Food, the very low risk level from eggs produced under the Lion Code, or produced under demonstrably equivalent comprehensive schemes, means that they can be served raw or lightly cooked to all groups in society, including those that are more vulnerable to infection, in both domestic and commercial settings, including care homes and hospitals.

However, as with all foods, it is important that eggs are handled correctly in order to minimise the risk of cross-contamination. Growth of salmonella can be prevented or minimised by low temperature storage, particularly in the kitchen, where temperature fluctuations can accelerate changes to yolk membrane permeability.

The advantages of low temperature storage are three fold: salmonella, if present, is unable to multiply; the yolk membrane remains essentially unchanged for long periods of storage; and any salmonellas present may be rendered more heat-sensitive by prior exposure to low temperature.

Eggs should therefore be kept at a constant temperature below 20°C to prevent deterioration in yolk membrane permeability and minimise growth of any micro-organisms that may be present.

Caterers should store eggs in a refrigerator. If this is not possible they should be stored in the coolest storage area available and

orders kept to a minimum volume and regularly delivered.

To avoid the risk of higher temperatures and of temperature fluctuations in a typical domestic kitchen, consumers should place eggs in the refrigerator as soon as possible after purchase.

Eggs should be stored separately from other foods, preferably in the egg box. Eggs should be brought to room temperature before cooking.

At room temperature homogenised egg provides an ideal medium for the growth of micro-organisms and it is therefore essential to avoid any risk of cross-contamination from other foods.

Cooked egg dishes should be eaten as soon as possible after cooking and, if not for immediate use, should be stored in the refrigerator.

Hands should always be washed before and after handling shell eggs. Cracked or dirty eggs should not be used.

In the catering industry, pasteurised egg products can be substituted for raw eggs if required for ease and convenience and for instances where eggs are pooled.

egg products

Egg products are obtained from eggs once the shell and outer membrane have been removed. These are made from whole egg, yolk or albumen.

The regulations covering manufacture of Egg Products were first introduced in 1993 and are now found in EU Hygiene Legislation.

They require that:

- Egg products must be processed on premises which have been approved by the Environmental Health Department of the local authority who will also be responsible for the supervision of approved establishments and the general enforcement of the Regulations.
- The use of centrifuging and crushing to obtain egg products for human consumption is banned.
- Bakers and caterers are required to use Class A hen shell eggs.
- Cracked eggs - eggs with a damaged shell where the membranes are intact, and

the egg contents are not exposed to the external environment - may be used for production of egg products for human consumption subject to extra precautions being taken during processing.

- Broken eggs - in which damage extends from the shell to the membrane, exposing the internal liquid contents - are banned for human consumption.

The ACMSF's recent report highlighted that outbreaks of salmonellosis have been linked to imported pasteurised egg products. They commented: "These products still carry a small risk of contamination and the potential for these products to become a problem in the future needs to be assessed".

However, the additional food safety benefits of eggs processed under the Lion Code for egg products help minimise any potential risks - for example, Lion egg products processors must use Lion Quality shell eggs sourced from egg producers and packers registered in the Lion Quality scheme.

code of practice for the production of Lion Quality egg products

There is a complementary Code of Practice for the production of Lion Quality egg products, which allows approved processors to use the Lion Quality mark on egg products. The Code is designed to minimise any potential risk. The recent ACMSF report highlighted that "although egg products are pasteurised, it is possible for treatment failures and recontamination to occur, but the risk applies primarily to imported eggs products since in the mainland UK, eggs from positive flocks

are not diverted to processing into egg products, whereas in many other EU countries this can be normal practice".

The Code of Practice for the production of Lion Quality egg products also has stringent food safety and hygiene practices covering processing procedures, quality control, freezing/defrosting procedures, pasteurising temperatures and packing instructions. The Code of Practice is policed by independent auditors.

government legislation

The following measures are currently applied to eggs produced in the UK:

Salmonella National Control Programme legislation

- The Zoonoses Order 1989 requires all isolations of Salmonella from specified species of animals, birds, carcasses, products or surroundings of an animal or bird or from any feeding stuffs to be reported to Defra (ref SI 1989/285).
- The Control of Salmonella in Poultry Order 2007 sets out specific sampling requirements for Salmonella in breeding and laying flocks required by the National Control Programmes for Salmonella. (ref SI 2007/3574). This Order implements the requirements of European legislation in Regulation (EC) No. 2160/2003 on the control of Salmonella and other specified food-borne zoonotic agents.
- The legislation also allows for various actions to be taken when specified Salmonella serotypes are found in breeding and laying flocks, including for restrictions to be imposed on the eggs from that flock and requiring the cleansing and disinfection of breeder houses when certain invasive Salmonella serotypes - Salmonella Enteritidis (SE), Salmonella Typhimurium (ST) and monophasic Salmonella Typhimurium strains - have been isolated. There is also compulsory slaughter if SE or ST are found in breeder flocks.

Egg Marketing Legislation

- The Egg and Chick Regulations (2009) England (SI 2009/2163) and equivalent in Wales, Scotland and Northern Ireland, covers production through to final sale, laying down stamping, labelling and permitted marketing of eggs. This legislation makes it mandatory to show a “best before” date for eggs on packs and for instructions to be printed on packs telling consumers to keep eggs refrigerated (chilled) after purchase. The EU regulatory provisions which apply to the marketing of eggs for consumption are contained in Council Regulation (EC) No. 1308/2013 and Commission Regulation (EC) No. 589/2008.

- These regulations cover the quality and weight grading, marking, packaging, storage, transport and labelling for retail sale.
- The Ungraded Eggs (Hygiene) Regulations 1990 banning the retail sale by egg producers of cracked eggs (ref SI 1990/1323).

Food Labelling Legislation

- Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25th October 2011 on the provision of food information to consumers. This piece of European legislation is called the EU Food Information for Consumers Regulation (EU FIC). It came into force on 13th December 2014 and changes the way allergen information appears on labels and on food that is prepacked, sold loose or served when you are eating outside of the home. The EU FIC brings general and nutrition labelling together into a single regulation to simplify and consolidate existing labelling legislation. - See more at <http://www.food.gov.uk/enforcement/regulation/fir>.

Food Hygiene Legislation

- The general hygiene requirements for all food business operators are laid down in Regulation (EC) No. 852/2004 and Regulation (EC) No. 853/2004. Regulation (EC) 2073/2005 lays down requirements for microbiological criteria in foodstuffs including egg products. Regulation (EC) No. 882/2004 and Regulation (EC) No. 854/2004 relate to the organisation of official controls on products of animal origin intended for human consumption.
- In general, the legislation covers production and handling of all foods along the whole food chain and includes specific requirements to minimise risks to the hygienic production of high quality eggs.
- National legislation includes the Food Hygiene (England) Regulations 2006, as amended in 2010 (SI 2010/534) and the Official Feed and Food Controls (England) Regulations 2006 as amended in 2011 (SI 2011/136). There is equivalent legislation in the rest of the UK.

government legislation continued

Government produced guidance available:

1. Code of Practice for the prevention and control of Salmonella in breeding flocks and hatcheries (1993).
2. A Guide to the National Control Programme for Salmonella in breeding flocks (revised 2014).
3. Code of Practice for the control of Salmonella during the production, storage and transport of compound feeds, pre-mixtures, feed materials and feed additives (ref PBI 3303 Oct 2009).
4. Code of Practice for the prevention and control of Salmonella in commercial egg laying flocks (revised 2007).
5. A Guide to the National Control programme for Salmonella in laying flocks (revised 2014)
6. Code of Practice for the prevention and control of rodent infestations on poultry farms (revised in 2009)
7. An education campaign in hygienic handling of food in the home (Eat well, be well. www.food.gov.uk).
8. Explanatory leaflet on legislation covering the production and marketing of eggs – EMRI <https://www.gov.uk/eggs-trade-regulations>

the british egg industry council

The British Egg Industry Council (BEIC) was set up to represent the egg industry after the abolition of the Eggs Authority in 1986. Its members are the eleven major associations concerned with the industry, incorporating breeders, hatcheries, pullet rearers, producers, egg packers and processors from all parts of the UK.

The BEIC is funded by voluntary subscriptions from egg packers and producers. It operates the Lion Code of Practice and BEIC subscribers conforming to the Code are entitled to use the Lion Quality mark, which is a Trade Mark owned by the BEIC.

The BEIC represents the UK egg industry in lobbying Government, Parliament, the European Commission, European Parliament and other institutions; and runs the British Egg Information Service (BEIS) which undertakes marketing activity on behalf of Lion Quality eggs.

