SUMMARY OF SUBSTANTIVE COMMENTS TO THE CONSULTATION ON THE ACMSF'S DRAFT REPORT: AN UPDATE ON THE MICROBIOLOGICAL RISK FROM SHELL EGGS AND THEIR PRODUCTS

Respondent	Comment	Response
British Egg Industry Council	Page 8, 2nd paragraph. We agree that the only group of micro-organisms which are of significant importance in respect of contents contamination is Salmonella, in particular *Salmonella* Enteritidis (SE).	Noted.
	Page 8, 3rd paragraph. We welcome that the Ad Hoc group differentiates the risk level of Lion eggs as 'Very Low' and for other eggs as 'Low'.	Noted.
	Page 8, 4th paragraph. We welcome recognition 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.	Noted.
	Page 8, 6th paragraph. Please note that the egg industry does not use 'use-by' dates. The marketing of eggs is governed by EU egg marketing legislation – Commission Regulation (EC) No 589/2008, Article 12.1.d "the date of minimum durability (i.e. 'best-before' date).	The Report has been amended to "best before"
	Page 9 – Key recommendation. We welcome the key recommendation of the Group that the FSA considers amending its advice on eggs.	Noted
	Chapter 1: Introduction Page 11, para 1.4 It is noted that human cases of SE are predominantly linked with non-UK eggs.	Noted

	Page 12, para 1.9 It is noted that there have been no egg-associated cases of human infection involving avian influenza virus, Campylobacter, Escherichia coli, and Listeria, in the UK.	Noted.
	Page 14, para 1.17 It should be noted that whilst the Salmonella National Control Programme has been implemented across all member states, the raft of measures on the control and effective elimination of Salmonella contained in the Lion Code of Practice go much further than required by EU and UK legislation. This includes; environmental sampling and testing of poultry houses at turnaround, sampling and testing of egg contact surfaces in egg packing centres; testing of eggs (shell and content); and a ban on the moulting of hens (known to be a 'stresser', which could trigger shedding of Salmonella if a hen was to be infected).	Noted.
	Page 16, para 1.23 The excellent progress of the UK egg industry in Salmonella control is noted by the very low incidence of flocks which have been identified as positive for the regulated serovars (*Salmonella* Enteritidis and *Salmonella* Typhimurium). In 2014, this was 0.08%, 2013 (0.07%), and 2012 (0.07%). The UK has the lowest rate of Salmonella of the largest producers in the EU. The fact that the rate of infection remains at e.g. 1.91% in Poland (2014) is worrying, particularly as the UK does import eggs from Poland.	Noted.
	Page 17, para 1.24 It is important to note that the UK voluntarily culls SE/ST positive flocks and does not divert eggs for heat treatment. This is not the case in many other member states.	Noted.
	Page 18, para 1.26 We assume the increase in England in 2014, due to SE PT14b, was due to imported eggs?	There was an increase of 4% in the reported number of S. Enteritidis cases in 2014, reflecting the national outbreak of phage type 14b in summer 2014 which was linked eggs imported from Germany. Reference: EFIG annual report 2014 and most recent publication http://mgen.microbiologyresearch.org/content/journal/mgen/10.1099/mgen.0.000070

	Page 27, para 1.57 It is noted that imported eggs were to blame for cases of SE PT1 and PT14b, linked to food service outlets.	Noted.
	Page 36, para 1.73 It is important to note that the UK voluntarily culls SE/ST positive flocks and does not divert eggs for heat treatment. This is not the case in many other member states.	Noted.
	Page 37, para 1.78 We welcome recognition that the UK has the lowest rate of Salmonella of the EUs largest producers.	Noted.
	Page 37, para 1.79 We welcome recognition that the vast majority of outbreaks of SE since 2009 have been linked to imported eggs and not UK produced eggs.	Noted.
	Page 37, para 1.81 We support the need to be alert to the threat posed by contamination of egg products, particularly imported egg products, where eggs from SE/ST positive laying flocks may be diverted for heat treatment.	Noted.
	Page 38, para 1.87 We will continue to work with the FSA and other government departments to ensure the safety of eggs.	Noted.
	Page 39, para 1.91 We agree with the need to improve the traceability of non-UK origin egg supplies into the catering sector.	Noted.
	Chapter 2: Identification of microbiological hazards associated with eggs and egg products Page 40, para 2.3 This states "Only Avian Influenza virus is associated with a significant number of human cases, but is very rare in the UK". This is misleading and could be taken out of context. We are not aware of any incidents of AI virus affecting humans in the UK, and certainly not via eggs. Whilst the first sentence of this paragraphs notes "…there is no evidence that handling, or consumption of table eggs is involved …", we suggest that this paragraph is clarified to avoid a potential link between the AI virus and eggs.	The report has been amended to read ""Only avian influenza virus is associated with a significant number of human cases **through occupational exposure**, but is very rare in the UK."

	Page 42, para 2.9 We are not aware of any incident relating to *Listeria monocytogenes* relating to processed liquid egg products	Noted.
	Page 42, para 2.10 We are concerned that reference to; "An example of this is likely to be *Campylobacter* infection linked to eggs", could be taken out of context. *Campylobacter* is not associated with eggs, but to broiler meat. We suggest that this paragraph is clarified as per paragraph 2.11.	We agree that this sentence could be misinterpreted and have removed it from the report.
	Page 42, para 2.11 Para 2.11 goes on to state; "It is most likely therefore that the small number of *Campylobacter* outbreaks that have been linked with egg products have been wrongly attributed or have resulted from substantial cross-contamination".	See previous comment.
	Page 45, para 2.19 The 'cool chain' requirement in the Lion Code, for eggs to be kept at less than 20^{o}C, is based on scientific evidence.	Noted.
	Page 47, para 2.23 The Lion Code provides advice to caterers and retailers on the handling and storage of eggs.	Noted
	Page 49, para 2.28 The requirements of the Lion Code across the integrated egg production chain are designed such that cross-contamination of eggs/egg products is minimised.	Noted.
	Page 54, Para 2.45 It is important to note that the UK voluntarily culls SE/ST positive flocks and does not divert eggs for heat treatment. This is not the case in many other member states.	Para 2.45 has been amended to "in many **other** countries".
	Page 55, para 2.46 The Code of Practice for the Production of Lion Quality Egg Products, sets a maximum date for eggs to be processed into either liquid egg or hard boiled eggs.	A full list of Lion Code measures has been added into the Report as an annex.
	Page 57, para 2.55 We welcome recognition that "… the small numbers of Campylobacter outbreaks that have been linked with egg products have been wrongly attributed, or have resulted from substantial cross-contamination".	Noted.

	Page 57, para 2.56 We welcome recognition that; “Commercial eggs do not represent a Campylobacter health hazard”.	Noted.
	Page 57, para 2.59 When the FSA advice to vulnerable groups is amended, we believe that the advice should clearly differentiate between hens eggs (from *Gallus gallus)* and other egg laying species. We therefore support the report where it would; “… not be advisable to relax current guidance of cooking of such (non chicken) eggs”. This would avoid misinterpretation by enforcement officers and consumers.	Noted.
	Chapter 3: Egg industry in the UK. Consumption patterns relating to different egg types and products Page 58, para 3.1 The egg market in the UK is growing, with the number of laying hens in 2015 estimated to be 36 million.	Thank you for providing this more up-to-date data. The Report has been amended.
	Page 58, para 3.2 Please see below (paragraph 3.2) with updated data for 2015; “ In 2015, it was estimated by the egg industry that approximately 12.2 billion eggs were consumed in the UK per annum (189 per Capita and 33 million per day). Egg sales were estimated to equate to £895 000 000. The UK egg market can be divided into retail (53%), food manufacture (23%) and food service (24%). It was estimated by the egg industry that 2,001 million eggs were imported into the UK in 2015 and 105 million eggs were exported from the UK. https://www.egginfo.co.uk/egg-facts-and-figures/industry-information/data ”.	Thank you for providing this more up-to-date data. The Report has been amended.
	Page 60, para 3.12 Provisional data for 2015 shows that egg consumption increased by 6 eggs per capita to 189 eggs, noting that 2014 data has been revised to 183 eggs per capita.	Thank you for providing this more up-to-date data. The Report has been amended accordingly.
	Chapter 4: handling and use of eggs Page 63, para 4.6 BEIC has a poster on correct egg handling which is available to caterers. It is available on our website at; https://www.egginfo.co.uk/foodservice-resources	Noted.

	Page 64, para 4.9 We welcome; "It is the view of the Working Group that if caterers use eggs sourced from producers operating under the Lion code, eggs can be used uncooked, but dishes must be protected from cross-contamination from other potential sources of Salmonella and other food borne pathogens". We agree that it is important; "… that caterers should use pasteurised egg for any food which is likely to be served uncooked, or lightly cooked, if 'Lion code' eggs are not used". We are confused at the reference to '(FSA 2002)' at the end of this paragraph.	Noted. The reference to FSA advice to caterers has been moved to improve comprehension of the last sentence.
	Chapter 5: Description of interventions relating to laying hens, chickens, ducks, quails and any other Page 72, para 5.5 It should be noted that the; "… statement from the then minister of Agriculture stating that "most egg production is infected with Salmonella", is incorrect. The statement was made by the then Junior Health Minister and was made on 3rd December 1988. Regarding the statement; "… but it is unclear which element of the scheme; vaccination or date stamping to help avoid poor stock control at retail and catering, was the most effective", we believe it was a combination of Salmonella vaccination, improved hygiene and biosecurity measures implemented on farm and proper rodent control, that led to the reduction of infection in flocks.	Thank you for pointing out this inaccuracy. Paragraph 5.5 has been amended. This statement relates to the paper Lane *et al* 2014.

	Page 79, para 5.17 In regard to the sentence; "Interference with these tests is possible through the use of antibiotics before the samples are taken", please note that it is a legal requirement for all medicines administered to be recorded in the medicines book. During the Lion Code audit, where the official sample is collected on behalf of the competent authority under the Salmonella National Control Programme, the medicines book is checked to ensure that if, for bird health or welfare reasons, an antibiotic has been administered, samples for Salmonella testing are not taken within the prescribed period. This is defined as 2 weeks on the paperwork entitled 'Control of Salmonella in Poultry Order, Sample submission and report form for testing of Laying flocks of domestic fowl for Salmonella; Lion Code Scheme' (CSPO 26 Lion Code (Rev. 02/05)).	This sentence has been amended to "Prior use of antibiotics may influence the results of such tests."
	Page 80, para 5.20 We wish to correct the statement; "The standard of sampling has never been physically audited …" This is not the case. All independent audits of Lion Code sites are by a UKAS accredited assurance scheme certification body. Indeed, auditors are subject to witnessing and calibration on an annual basis, including 'shadow' auditing by a UKAS assessor on a sample basis. We wish to point out that the statement; "The standard of auditing of farm biosecurity standards is, however, sometimes open to question as farms that have proved to be positive have had significant rodent problems that have not been identified by auditor visits", is not the case today. The Lion Code places great importance on effective rodent control and this is an important part of the Lion Code audit.	The statement has been amended to ". . . audited by the competent authority . . ."

	Page 80, para 5.21 We welcome the statement that; "The caveats above (para 5.20) …. it is clear from both farm and human data that British table eggs are no longer a relevant source of Salmonella infection, and that the UK chicken industry has the lowest rate of regulated Salmonella serovars of any major poultry producing nation. UK eggs produced under comprehensive schemes mentioned above, in particular, present a minimal risk to human health". This is linked to para 5.37. Please note that where reference is made to "UK chicken industry", this should be amended to "UK egg industry".	Noted. We agree and the report has been amended.
	Page 86, para 5.37 Please note that where reference is made to "UK chicken industry", this should be amended to "UK egg industry".	We agree and the report has been amended.
	Page 87, para 5.43 With regard to the sentence; "The Hygiene Regulations, specifically Regulation 853/2004, specifies a 'sell by date' of 21 days – i.e. table eggs must be placed on the market within a maximum of 21 days after lay", we suggest this is reworded as; "The Hygiene Regulations, specifically Regulation 853/2004, specifies a 'sell by date' of 21 days – i.e. table eggs can only be offered for sale to consumers up to a maximum of 21 days after lay".	We agree and have amended this sentence as suggested.
	Page 88, para 5.47 Due to concerns that ineffective egg washing could lead to an increase in contamination of eggs destined for Class A retail sale, we support the current ban on washing of eggs for Class A sale.	Noted.

	Page 91, para 5.55 We agree that; "… vaccination of laying hens was the most important and successful intervention for prevention of human infection …". However, we should point out that it is vaccination, combined with high standards of hygiene and biosecurity on farm and effective rodent control, that has contributed the most to the success of the Lion Code in reducing flock infection. The Lion Quality scheme is the only assurance scheme that has such a comprehensive suite of measures designed to ensure egg safety.	Noted.
	Page 96, para 5.70 This supports the Lion Code requirement for a cool chain from lay to retail sale.	Noted.
	Page 101, para 5.83 The Lion Code prohibits the moulting of laying hens. Where reference is made to; "However, under stress (water deprivation, viral or coccidial infection, stressful environments and moulting) the hens may resume shedding (Skov et al., 2002)", we suggest this is amended to include the word "induced" in front of "moulting".	We agree and have included the word "induced" before "moulting".
	Page 109, para 5.108 We fully support the statement that; "Continued surveillance of human and veterinary salmonellosis is essential to detect emerging and future problems".	Noted.
	Page 109. Para 5.109 The statement that; "… there are still UK outbreaks being reported that involve non-UK produced eggs", illustrates that pressure should be placed on those countries exporting to the UK, where there remains a Salmonella 'problem'.	Noted.

	Chapter 7: Role of different *salmonella* Serovars in egg contamination Page 118, para 7.6 We welcome the statement which recognises that; "The extent to which shell contamination can contribute to egg-borne infection is unknown, but in view of the low prevalence and low numbers of organisms found on eggshells, human infection could only result from cracking and pooling of eggs and subsequent storage temperature abuse. The possibility of egg shells contaminating staff and kitchen equipment is also unquantified, but would also be expected to represent a low risk".	Noted.
	Page 124, para 7.24 We agree that with the measures already taken to control *Salmonella,* combined with the food safety measures in the Lion Code, that; "…. the threat is at a much lower level than that which was posed by Salmonella Enteritidis and is largely confined to areas of the world outside the UK".	Noted.
	Page 124, para 7.25 We support the recommendations that; "Information should be obtained on characteristics associated with the ability to vertically transmit into the egg contents so that new and emerging Salmonella strains with these characteristics can be identified at an early stage".	Noted.
	Chapter 8: Importance of surveillance and identification of emerging threats Page 127, para 8.6 We are concerned by the implied criticism that a producer may cheat while taking their 15 week operator samples. An 'official' sample is collected once a year under the control of the competent authority. Indeed, the 'proof in the pudding' is that there has been a significant reduction in levels of human Salmonellosis, meaning that infection of poultry flocks is very low.	This was not intended as a criticism but simply points out that the potential exists for deception. For example, this does not need to be fraudulent but could be due to less sensitive testing.
	Page 127, para 8.7 We agree that industry, working in partnership with government, is the most effective means of dealing with issues.	Noted.

	Page 127, para 8.8 We agree that; "… the PTs that are found increasingly reflect sources outside the UK, for both travel-related and 'domestically' acquired cases". We also agree that; "A combination of phage typing and antimicrobial resistance testing has been particularly useful to elucidate the origin of particular strains, e.g. nalidixic acid resistance is characteristic of isolates from those countries where fluoroquinolone antibiotics are inexpensive and have been routinely used in previous years, or in some cases currently, to control Salmonella in breeding flocks. This particularly applies to certain Mediterranean and Eastern European Countries". This is where resources need to be concentrated, i.e. to pressure those member states, where standards are below those of the UK, to improve their practices.	Noted.
	Chapter 9: Recommendations Page 130, Key Recommendation We fully agree with the key recommendation that; "The Group recommends that the Food Standards Agency considers amending its advice on eggs in the light of the Group's risk assessment". We believe that this should be completed as soon as possible.	Noted.
	Pages 130 to 132 We fully support the recommendations made on pages 130 – 132.	Noted.

	Conclusion	
	The report considers 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”.	Noted.
	We are delighted that the report acknowledges the success of the Lion Code in reducing the prevalence of Salmonella Enteritidis in laying flocks.	Noted.
	The success of the measures introduced to address Salmonella infection of laying flocks can be measured by the large reduction in human salmonellosis.	Noted.
	We urge the FSA to accept the ACMSF’s risk assessment and recommendations, and update its advice to vulnerable groups as soon as possible.	Noted.
	Please note that the FSA press release of 22nd February 2016 (which launched the consultation) refers to; “... or eggs produced under equivalent schemes ...”. However, the ACMSF report clearly stated “... or produced under demonstrably equivalent comprehensive schemes ...”. This is an important differentiation, as we are not aware of any other assurance scheme that has such a comprehensive suite of measures as the Lion Code. To avoid misinterpretation by enforcement bodies and consumers, this should be clarified.	This is a matter for the FSA. Additional detail has been added to the report.
	We also believe that it should be made clear that any change in advice is confined to chicken eggs (from *Gallus gallus*), and not duck, quail etc, eggs.	We believe this is clear in the Report.
	We are immensely proud of what has been achieved by members of the Lion Quality scheme. We will continue to keep the Lion Code under review, and respond to any emerging issue before it can become an issue.	

Respondent	Comment	Response
Food and Drink Federation	<u>Consumption of Raw or Lightly Cooked Eggs</u> Overall, FDF considers that the draft report is well written and contains the necessary and appropriate information and level of detail to provide confidence in Lion Mark eggs, or those produced under equivalent schemes, for consumers in the most vulnerable groups. However, we presume that, if the report assertions are accepted, this leaves the situation where one type of shell egg (i.e. Lion Mark or equivalent) can be served raw or lightly cooked to those in the most vulnerable groups, whilst other eggs (i.e. non-Lion Mark and non-hen) may not. We would also highlight that there will be added complexity in the catering environment and shell eggs consumed in restaurants and cafes etc. The challenge for FSA, as a result of this draft report, therefore appears to be risk communication to consumers and careful consideration of how this will be handled. This will be especially important, given that the advice in the draft report is contrary to current FSA advice. We would suggest that there will be additional issues related to pooled eggs and the avoidance of shell contamination, which also need to be communicated to consumers in a clear and concise manner.	Noted. This comment relates to risk management and will be for the FSA to consider. We agree, this will be for the FSA to consider. This is for the FSA to consider.

	Minimum Durability Consumption of eggs in relation to their indication of minimum durability is an area where we note there is conflicting advice. The draft report states that the Best Before date on eggs should be observed by consumers, whereas the NHS currently notes that eggs can be consumed beyond their Best Before date. FSA advice on this subject appears to be varied, with some advising simply not to consume eggs after their Best Before date and others saying that they may be consumed at this stage, if fully cooked[1]. We believe it is important, as part of this exercise, to clear up such confusion and provide clear, consistent advice to consumers. [1]https://www.food.gov.uk/news-updates/campaigns/germwatch	The *Ad Hoc* Group has pointed out to the FSA that the advice varies.
	Storage As far as we are aware, all current advice regarding the storage of eggs is to store chilled (i.e. refrigerated below 8°C in catering, food production and domestic premises) to limit Salmonella growth. However, eggs are routinely sold under ambient conditions in retail outlets, with possible temperature abuse during the distribution chain. This potentially sends confusing messages to consumers and, in view of the conclusions of the draft report, could put vulnerable consumers at risk. We believe it would therefore be beneficial to address this anomaly as part of the action plan in responding to the recommendations of the report.	The discrepancy is noted, but this is a risk communication issue.

Respondent	Comment	Response
NHS National Services Scotland	I have contacted our catering manager/health boards regarding the recommendations and we are happy with the recommendations and conclusions From a Scotland point please note the following • All hospitals only use pasteurised eggs for patients and it is our intention to continue this practice • Small amounts are purchased "fresh" and these are used for staff dining/cafe areas and it is our intention to continue this practice • Not all boards purchase • All eggs purchased display the red lion and are bought locally (not from supermarkets etc) • Nursing/care homes currently buy a mixture of fresh and pasteurised and it is their intention to continue this practice	Thank you for comments which have been noted.
	From a procurement point • All pasteurised egg (chilled and frozen) must have full traceability back to farm and this is check prior to any contract being awarded • All pasteurised egg (chilled and frozen) must be part of an assurance scheme – please note that we would not state only British Red Lion – as we would be tendering in the EU • All pasteurised egg (chilled and frozen) suppliers must release tests carried out and results • All products that contain egg – it is a requirement that only pasteurised egg is used and again all the steps above must be adhered to	Thank you for comments which have been noted.

Respondent	Comment	Response
Public Health England	1. We agree with the Working Group's view that there has been a major reduction in the microbiological risk from *Salmonella* in UK hens' shell eggs since the 2001 ACMSF report. The risk from non-UK eggs has also been reduced but not to the same extent. This view is based on human disease data as well as data from the UK poultry populations and the information on the statutory controls now in place under EU and national legislation. 2. Therefore we agree that the risk level for UK produced eggs is likely to be low and specifically for UK eggs produced under enhanced hygiene and control requirements such as required by assurance schemes like the Lion Code scheme, the risk level is likely to be very low. However, a lack of information provided in the report on the specific measures implemented by such assurance schemes and how these measures are audited/enforced means we can only note a moderate level of confidence in this assessment.	Noted. Further information about the Lion Code scheme has now been added at Annex IV.
	3. PHE considers that there remain uncertainties around many of the stated conclusions and risk estimates so it is recommended that these uncertainties are addressed in the report and that data gaps are indicated.	The main data gaps and uncertainties have now been summarised in the Report.
	4. We would like more information in order to be able to support the assessment that the serving of raw or lightly cooked eggs sourced from a UK assurance scheme prepared in a commercial/catering/institutional setting constitute a very low risk of foodborne disease transmission to all groups in society. We consider that the risk may be higher than indicated in the report just in relation to source of eggs in these specific settings and this is of specific relevance to the vulnerable groups population.	This point has been addressed in revised wording in the Overall Risk Assessment at the beginning of the report.

	5. It should be noted that the UK population demographics are dynamic – the ageing population, potentially increased susceptibility to disease through the effects of other concurrent diseases/chronic debilitating conditions and the effect this has not only on the definition of the term 'vulnerable groups' but also on the level of potential increased susceptibility to disease of the population. We do not yet fully understand who our 'vulnerable groups' in society are, and the potential cumulative impact that multiple vulnerabilities may give rise to. We do not yet fully understand the role of factors such as deprivation, age, gender and co-morbidities on the risk of infection and, furthermore, on the role of these factors in the development of more severe consequences of infection and the development of long-term complications following infection. Having a better understanding of these factors, through research currently being conducted, would provide a basis to enable us to support the report conclusions.	It is accepted that the UK population demographics are dynamic. ACMSF will not only keep the specific guidance under review but also maintains a watching brief on foodborne hazards and vulnerable groups, as reflected in previous specific subgroup reports. We are also aware that the FSA is currently considering vulnerable groups in a wider context.
	6. It is recognised that risk management is not within the remit of the Committee and therefore not within the scope of the consultation. However, PHE would wish to note that consideration of what constitutes an acceptable level of risk, especially in relation to vulnerable groups, is important. Communication of the report recommendations regarding lightly cooked / raw eggs and specifically managing the risk around this recommendation in a catering/institutional will be challenging with the potential for an increased risk of foodborne disease transmission. In particular caterers may not discriminate between Lion and non-Lion code eggs which, combined with documented poor practices in this sector, would pose an unacceptable risk.	Noted, but risk management is not within the remit of this Group.

	Chapter 1 Conclusions There were just over 1700 reports of laboratory confirmed non-travel associated *Salmonella* Enteritidis in England and Wales in 2014. The true disease burden at population level is considered to be considerably greater than that indicated by laboratory reporting as referenced in the report[1]. Each year only a small percentage of cases are specifically linked to foodborne disease outbreaks which are investigated and a putative or confirmed food vehicle determined, therefore the origin/food vehicle of infection in the majority of cases is not determined. The difficulties in conclusively determining a food source during an outbreak investigation are detailed in the report. While it is agreed that the contribution of imported eggs to foodborne disease outbreaks in the UK most likely exceeds that of locally produced eggs – the quantification of the contribution of UK produced and specifically of eggs produced under certified assurance schemes to the overall burden of domestically acquired *Salmonella* Enteritidis infection in the UK population is not fully known. It is recommended that this uncertainty is reflected in the overall assessment of the risk posed from UK produced eggs being 'low' or 'very low'.	We consider our risk assessment has taken account of this uncertainty.
	Chapter 1 Recommendations We agree with the importance of continuing to monitor, fully investigate and communicate the outcomes of all foodborne disease outbreaks with a confirmed or a putative link to eggs In the light of the currently unknown true prevalence of *Salmonella* spp in UK-produced and imported eggs and egg products (considering that egg surveys carried out in the past pre-date many changes documented in the report since 2001 and later years), the use of egg surveys will help provide an	Noted. Noted and agree that egg surveys would be helpful, as indicated in paragraph 1.89.

[1] Tam et al, 2012. Longitudinal study of infectious intestinal disease in the UK (IID2 study): incidence in the community and presenting to general practice. Gut, 61, 69-77.

	evidence base for policy decisions regarding the risk management measures necessary to reduce burden of disease due to *Salmonella* from eggs in the current situation. We strongly support the recommendation that traceability of eggs should be improved, especially where imported eggs are concerned. This will facilitate the investigation of foodborne outbreaks where eggs may be the implicated food vehicle and allow more timely application of controls to limit the extent of the outbreak.	Noted.
	Chapter 2. Conclusions No comments. Agree with conclusions. **Chapter 3. Conclusions** No comments. Agree with conclusions. **Chapter 3. Recommendations** No comments – agree with recommendation	Noted. Noted. Noted.

	Chapter 4. Conclusions Egg pooling, poor storage conditions and cross contamination (especially in a catering establishment setting) are significant contributory factors for the risk of transmission of *Salmonella.* The report documents study findings that indicate poor practices around these specific aspects as well as a lack of current information indicating any potential change/improvement in these practices. The ability of even very low levels of *Salmonella* contamination (whether originating from the egg itself or from cross contamination of raw eggs via the environment/other contaminated foodstuffs during preparation) to pose a risk through multiplication in case of temperature abuse is important. It should also be noted that previous publications indicate that foodborne outbreaks are linked most commonly to food service/catering establishments, with restaurants/takeaways and hotels accounting for the majority of these outbreak settings.[2] Paragraphs 4.15 and 4.16 do cover these points but it is not clear from the conclusions if these factors have been fully taken into account in assessing the risk of disease transmission in a catering/institutional setting specifically leading to the overall risk assessment that eggs constituting a very low risk can be served raw or lightly cooked to all groups in society, including pregnant women, the young and the elderly, in commercial/catering settings.	This has been addressed by amended wording in the Overall Risk Assessment at the beginning of the Report.
	We agree that risk posed by eggs produced under robust certified farm assurance schemes such as the Lion Code Scheme is likely to be lower than those produced without additional hygiene controls/risk management measures. However, we are not able to specifically assess the likely effect of these measures for risk mitigation and therefore the validity of the conclusions as there is insufficient detail given on the	Further information about the Lion Code scheme has now been added at Annex IV.

[2] Gormley FJ, et al. A 17-year review of foodborne outbreaks: describing the continuing decline in England and Wales (1992-2008). Epidemiol. Infect. 2011 May;139(5):688–99.

	specific farm assurance scheme requirements as well as how compliance with these requirements is monitored and enforced by the scheme beyond the annual farm audit noted in the document. Therefore would recommend this detail is included as the basis/ evidence for the conclusions reached by the group on the assigned lower risk status of eggs produced under the Lion Code or equivalent assurance scheme.	
	Chapter 4. Recommendations Strongly agree with the recommendation to obtain up to date information on catering practices that have been demonstrated to be significant contributory factors to foodborne outbreaks as well as review of the uptake of FSA advice on good hygiene practices to assess the effectiveness of advice in especially catering/institutional settings. In the absence of such information, together with the evidence we have from research studies demonstrating poor practice in the catering industry, we consider it is difficult to assess the overall risk of foodborne disease transmission posed by the consumption of lightly cooked/raw egg-containing foods prepared in these settings, especially in the case of vulnerable groups. The basis for the recommendation in paragraph 4.35 is not clear on this. Regarding the recommendation for the use of pasteurised egg to be used for any food which is likely to be served uncooked or lightly cooked – see comment below on recommendation from chapter 5.	Noted.

	Chapter 5. Conclusions Generally agree with conclusions. The limitations in the sensitivity of the farm - level *Salmonella* monitoring scheme are documented in this chapter, indicating that the true prevalence of *Salmonella* Enteritidis may be higher than that indicated by the data reported in chapter 1 table 1 and we consider that this is probably true for the UK as well as other countries. No detail is given on the additional testing carried out or the level of improvement in monitoring sensitivity although the report notes that 'enhanced testing for *Salmonella*' by members of the Lion Code Scheme. We have the same comment as for chapter 4 above that would recommend more detail is included on the assurance scheme requirements and how these requirements are enforced, to justify the assessment of a 'minimal risk to human health' compared to eggs not produced under an equivalent scheme (paragraph 5.21).	Further information about the Lion Code scheme has now been added at Annex IV.
	Chapter 5. Recommendations Agree on the need for validation of heat treatment methods (paragraph 5.50). Evidence of outbreaks linked to pasteurised egg products is documented in the report and this may be an underestimated risk. The report also notes in Chapter 2 that, while in Great Britain, laying flocks infected with *Salmonella* Enteritidis are slaughtered, so the entry of contaminated eggs into processing establishments should be low, this is not the case in other countries where, since 2009, eggs from infected flocks can be routinely diverted for heat treated product for the remainder of the productive life of the flock. Therefore, current methods should be assessed to take into account the possibility that more known *Salmonella* positive eggs may be diverted to heat treatment in other countries that currently export pasteurised egg products to the UK (or potentially in Great Britain if market forces make this a viable economic option in future).	Noted.

	Chapter 6. Recommendation No comments – agree with recommendation.	Noted.
	Chapter 7. Conclusions The report documents the recent emergence of other *Salmonella* strains in Europe that have also been detected in UK flocks (e.g. multi-drug resistant *Salmonella* Infantis). The future risk posed by eggs as a food vehicle for transmission of these serovars with demonstrable ability to cause human disease should be considered.	Noted. This has been covered in the report.
	Chapter 7. Recommendation No comments – agree with recommendation.	Noted
	Chapter 8. Conclusions. No comments – agree with conclusions.	Noted.

List of Respondents:

1. British Egg Industry Council
2. Food and Drink Federation
3. NHS National Services Scotland
4. Public Health England
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