EXPLANATORY MEMORANDUM TO

THE CONTROL OF SALMONELLA IN POULTRY ORDER 2007

2007 No. 3574

1. This explanatory memorandum has been prepared by Department for Environment, Food and Rural Affairs.

2. Description

2.1 This instrument sets out specific sampling requirements for breeding and laying flocks of birds of the species *Gallus gallus* required by the National Control Programmes for *Salmonella*. The instrument also requires operators of breeding and laying flocks to provide the Secretary of State with certain information relating to those flocks, and imposes record-keeping requirements.

3. Matters of special interest to the Joint Committee on Statutory Instruments

3.1 None

4. Legislative Background

4.1 This Order implements monitoring and controls for breeding flocks required in Regulation (EC) No. 2160/2003 of the European Parliament and of the Council on the control of *Salmonella* and other specified food-borne zoonotic agents and Commission Regulation (EC) No. 1168/2006 as regards a Community target for the reduction of prevalence of certain *Salmonella* serotypes in laying hens of *Gallus gallus*. This Order revokes and remakes monitoring and controls for breeding flocks implemented by The Poultry Breeding Flocks and Hatcheries (England) Order 2007, required by Commission Regulation (EC) No. 1003/2005 as regards a Community target for the reduction of the prevalence of certain *Salmonella* serotypes in breeding flocks of *Gallus gallus*.

5. Extent

5.1 This Order applies to England.

6. European Convention on Human Rights

As the instrument is not subject to Parliamentary procedure and does not amend primary legislation no statement is required.

7. Policy background

7.1 Zoonoses are diseases which are transmissible between animals and man. Directive 2003/99/EC of the European Parliament and of the Council on the monitoring of zoonoses and zoonotic agents and Regulation (EC) No. 2160/2003, provide for the protection of human health against zoonoses and zoonotic agents in animals and products of animal origin.

7.2 Commission Decision (EC) No. 1168/2006 made under Regulation (EC) No. 2160/2003 sets an annual target to reduce the prevalence of *Salmonella* Enteritidis or *Salmonella* Typhimurium in commercial laying flocks of domestic fowl in the UK. The target is for annual reduction of at least 10% in the number of positive adult laying flocks compared with the previous year from a starting baseline prevalence of 8%. The National Control Programme for laying

flocks sets out the framework of controls described in Regulation 2160/2003 to meet the target and sampling described in Regulation (EC) No. 1168/2006 to verify that the target has been met.

7.3   Commission Regulation (EC) No. 1003/2005 made under Regulation (EC) No. 2160/2003 sets an annual target to reduce the prevalence of *Salmonella* Enteritidis, *Salmonella* Hadar, *Salmonella* Infantis, *Salmonella* Typhimurium and *Salmonella* Virchow in commercial breeding flocks of domestic fowl in the UK. The target is to maintain the prevalence of these serotypes to a target level of 1% or less of breeding flocks infected. The requirements of this Decision were part of a consultation which was completed in November 2006.

8.   Impact

8.1 An Impact Assessment is attached to this memorandum which describes in detail the impact and associated costs and benefits for the public and private sectors.

9.   Contact

John Conway at the Department of Environment, Food and Rural Affairs.
Tel 020 7904 6117 or e-mail: john.conway@defra.gsi.gov.uk can answer any queries regarding the instrument.

Summary: Intervention & Options		
Department /Agency: **Department for Environment, Food and Rural Affairs**	**Title:** **Impact Assessment of The Control of *Salmonella* in Poultry Order 2007**	
Stage: Final Proposal	**Version:** 1	**Date:** 29 November 2007
Related Publications: Initial Regulatory Impact Assessment		

Available to view or download at:

http://defraweb/corporate/consult/default.asp

Contact for enquiries: John Conway/Paul Crittenden   **Telephone:** 020 7904 6117

What is the problem under consideration? Why is government intervention necessary?

The National Control Programme for laying flocks put in place a statutory monitoring programme for laying flocks. A recent survey revealed that *Salmonella* of human health significance was present on 8% of UK holdings. This demonstrates that industry has been successful (in particular when compared to producers in other Member States) in the control of *Salmonella*. However since the public cannot readily identifiy which eggs are infected with *Salmonella*, there is a need to minimise the possibility of infected eggs entering the human food chain and putting human health at risk.

What are the policy objectives and the intended effects?

The UK is committed to reducing *Salmonella* serotypes of public health significance at national and European Community level for the protection of public health. The NCP sets out the controls and minimum sampling requirements in EU Regulations 2160/2003 and 1168/2006. These are:

1. To meet a reduction target of *Salmonella* of human health significance

2. Specify minimum sampling requirements (twice during rearing and then every 15 weeks)

3. Require that eggs intended for human consumption from infected flocks are pasteurised.

 What policy options have been considered? Please justify any preferred option.

Our intention is to implement option 3 under which responsibilities for the management and auditing of the NCP is shared between government and industry. The rejected options were:

Option 1 (do nothing) - breach of EU obligations and commitment to public health.

Option 2 (for auditing and sampling under the complete control of government) - unnecessary level of government expense and involvement.

Option 4 (delegation of auditing and sampling to an industry led Independent Control Body) - decided it impractical to expect an ICB to be ready to take this level of responsibility.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects? Government will monitor progress of the NCP. The EU legislation provides for a review after its first year of implementation in December 2009.

<u>Ministerial Sign-off</u> For SELECT STAGE Impact Assessments:

> *I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister:

Jeff Rooker

.... Date: 18 December 2007

Summary: Analysis & Evidence

Policy Option: 3	Description:

	ANNUAL COSTS		Description and scale of **key monetised costs** by 'main affected groups' Business and Government Annual Costs: £7.2m (PV: £28.6m). All routine control and sampling costs will be passed to the farmers. The costs of repeat sampling when *Salmonella* is detected on a holding will be covered by Defra (unless optional sampling is requested by the farmer) this would only be a small proportion and has not been calculated separately.
COSTS	**One-off** (Transition)	**Yrs**	
	£	4	
	Average Annual Cost (excluding one-off)		
	£ 7.2m		**Total Cost** (PV) £ 28.6m
	Other **key non-monetised costs** by 'main affected groups'		

	ANNUAL BENEFITS		Description and scale of **key monetised benefits** by 'main affected groups'
BENEFITS	**One-off**	**Yrs**	Public Health Annual Benefits: £15.4m (PV: £61.4m)
	£	4	
	Average Annual Benefit (excluding one-off)		
	£ 15.4m		**Total Benefit** (PV) £ 61.4m
	Other **key non-monetised benefits** by 'main affected groups' Travellers abroad to other EU nations will face a reduced risk of *Salmonella*.		

Key Assumptions/Sensitivities/Risks: Initial holding prevalence rate 8% and drops by 10% per year. 65% of flocks on holing infected. Average remaining lifespan of a hen is 6 months. Prevalence rate varies depending on holding size. Average time infected eggs could enter into food chain before detection 7.5 weeks. 20% of human *Salmonella* cases related to the consumption of infected eggs (sensitivities performed around this).

Price Base Year 07/08	Time Period Years 4	**Net Benefit Range** (NPV) £ 2.1m-63.6m	**NET BENEFIT** (NPV Best estimate)

What is the geographic coverage of the policy/option?			UK	
On what date will the policy be implemented?			February 2008	
Which organisation(s) will enforce the policy?			Animal Health	
What is the total annual cost of enforcement for these organisations?			£	
Does enforcement comply with Hampton principles?			Yes	
Will implementation go beyond minimum EU requirements?			No	
What is the value of the proposed offsetting measure per year?			£ 0	
What is the value of changes in greenhouse gas emissions?			£ 0	
Will the proposal have a significant impact on competition?			No	

Annual cost (£-£) per organisation (excluding one-off)	Micro £284	Small £621	Medium	Large
Are any of these organisations exempt?	No	No	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices)		(Increase - Decrease)
Increase of £ 265,000	Decrease of £ **Net Impact**	£ 265,000

Key:	**Annual costs and benefits: Constant Prices**	**(Net) Present Value**

1.   Introduction.

1.1.   The Control of *Salmonella* in Poultry Order 2007 ('The Poultry Order') enforces a National Control Programme (NCP) for laying flocks that implements the requirements of EU Regulations 1168/2006 and 2160/2003. These Regulations set out enhanced monitoring and controls for *Salmonella* in laying flocks. By February 2008 all Member States will be required to have a NCP in place for laying flocks. The National Control Programme applies to all those who produce eggs on a commercial basis other than those exempted under EU Regulation 2160/2003. It requires Competent Authority/operators to:

- Reduce the prevalence of *Salmonella* of public health significance (*Salmonella* Enteritidis and *Salmonella* Typhimurium) in flocks of domestic fowl (Gallus gallus) on holdings in the UK producing eggs for human consumption at least to the target levels set out in Regulation (EC) No 1168/2006, which is an annual reduction of at least 10% in the number of positive adult laying flocks compared with the previous year. The starting baseline will be 8% for the combined prevalence for *Salmonella* Enteritidis and *Salmonella* Typhimurium. Each Member State has been set a reduction target. Member States with the highest prevalence figures in the baseline survey will be required to reduce their levels most quickly.

- Meet minimum sampling requirements during the rearing and laying stages.

- Take specific control measures following the detection of *Salmonella* Enteritidis or *Salmonella* Typhimurium to protect human health. Such measures will include that from 2009 eggs originating from infected flocks cannot be sent for human consumption unless they are treated in a manner which guarantees the elimination of all *Salmonella* serotypes with public health significance, i.e. heat treated. In addition from November 2007 this requirement will apply to flocks when the eggs from the flock are linked to a foodborne outbreak of *Salmonella* in humans.

1.2.   <u>Re-evaluation of Benefits and costs</u>

1.2.1.   A full public consultation on plans to implement a NCP for laying flocks ran from July to October 2007. At the end of this consultation and after further discussions with industry we decided that option 3 was most cost effective to both government and industry. Under this option the responsibilities for the management and auditing of the NCP will be shared by government and industry. The Regulatory Impact Assessment (RIA) indicated that there was not a substantial cost difference between any of the options (apart of course from the do-nothing option).

1.2.2.   The consultation documents were drafted before the new Impact Assessment template was introduced across Defra and the benefits and costs were set out in the Regulatory Impact Assessment format. This information is now re-presented in the Impact Assessment format.

1.2.3.   The RIA costs and benefits were based on data available to Defra from industry and the farm census. In the consultation response the figures were challenged by industry representatives who felt that the implementation options underestimated the real costs to producers. Consequently we re-evaluated the costs for the completion of the Impact Assessment with additional data. Our revised figures show that the true costs over the first 3 years of the NCP to producers are likely to be higher: £28.6 million against £19.2 million in the original estimate. However on reconsidering the costs we also recognised that the benefits had also been underestimated. Since all positive flocks would be taken out of production as soon as a positive sample was found in 2009, the benefits to human health from a reduced risk of consuming infected products would be immediate.

Therefore the revised benefits are also higher: £61.4 million against £13.9 million in the original RIA. A full analysis of the likely impacts of these Regulations is below.

2.   Overview of Benefits and Costs.

2.1.   There would be human health benefits to society as a whole of effective sampling practice and action as detailed in the legislation to reduce further the risk of *Salmonellas* of public health significance entering the food chain. It should also be noted that improved farm hygiene and biosecurity to reduce *Salmonellas* can be beneficial for other disease control purposes and demonstrably consistent with EU standards.

2.2.   The success of the control programme in breeding flocks means that the day old layer chicks placed on farms should be free of *S.* Enteritidis and *S.* Typhimurium. Whichever of the options from 2 to 4 that can be successfully implemented they should enable the layer flock sector to be part of an integrated approach to food safety through adequate and harmonised monitoring and controls across the EU. In this way our industry and consumers should be able to benefit from other Member States implementing this legislation and reaching their targets.

3.   Benefits and costs of option 3.

3.1.   The EU Regulation is prescriptive in its requirements and so there has been limited scope to minimise its impacts on industry. The RIA focused on controlling the implementation costs to producers. Option 3 enables industry to take responsibility for delivering the NCP in partnership with Government. Regulation (EC) 2160/2003 allows for producers and their representative bodies to put forward their own control programmes to run alongside the National Control Programme. This option was supported by the British Egg Industry Council (BEIC) which represents major UK producers and covers 85% of egg production. BEIC plan to submit their Lion code scheme for approval as an industry control plan. When this option is implemented Lion Code members will be sampled and audited by an independent auditor which would work closely with Animal Health to ensure all the requirements of the Regulation are delivered.

4.   Rearing flocks.

4.1.   The NCP requires that samples should be collected on two occasions from the rearing flock. Assuming that there will be one flock per holding the cost will be:

£32.00 x 2 for collecting the samples (assuming 2 hours per flock of operator time)
£18.50 x 2 for testing the sample (1 pooled sample per flock)
£1.50 x 4 for sampling equipment (2 samples per flock)

Total: £107.00 for two sampling occasions for one rearing flock

4.2.   For the purposes of this IA it is assumed that it will be possible to check that sampling and testing is taking place at rearing flocks when auditing the laying flock holding. Producers currently operating under the Lion Code are expected to only accept rearing flocks accompanied with a "passport" that confirms that the rearing farm belongs to the Lion Code and complies with its testing requirements. A similar auditing system could be adapted for the requirements of the NCP.

5.   Laying flocks.

5.1.   Samples should be collected from each flock on a holding every 15 weeks during the production phase. It is assumed that there will be three annual operator sampling occasions. On each sampling occasion for a holding with 5 flocks the cost is estimated at:

£1.50 x 10 for equipment to collect the ten samples

£18.50 x 5 for testing the five pooled samples
£16 x 2 for operator time
Assuming the holding has 5 flocks all the above estimates are multiplied by 2.8 (one flock tested twice, four tested three times)

Total: £139.50 per sampling occasion. £390.60 per annum.

6.   Sampling under the control of the Competent Authority.

- In one flock per year on holdings which have at least 1,000 birds.

6.1.   Competent Authority (or 'official control') samples are defined as samples which are collected under the control of the Competent Authority (i.e. the CA officer could collect the sample or supervise the collection of the sample by a third party – for instance a farm operator). Under the NCP these will be collected from one layer flock on each holding with more than 1,000 birds during the period of production of eggs for human consumption as specified in 2.1 of Annex to Commission Regulation (EC) No 1168/2006. Sampling carried out under the control of the CA may replace one sampling at the initiative of the operator.

6.2.   These samples consist of 2 pairs of boot swabs or 2 x 150g faeces samples from caged flocks in addition to one 100 gram sample of dust (or if insufficient dust is present, an additional sample of pooled faeces, or an additional pair of boot swabs or socks).

6.3.   It is our intention to recover costs for services provided by Government bodies, including Animal Health and VLA, in relation to official sampling under the layer NCP.

6.4.   The cost estimate for option 3 includes the baseline costs which will cover the operator sampling. These include the cost of familiarising staff with the new sampling requirements and the cost of collecting and testing the samples. The estimates also include charging by government for services in relation to official control sampling where provided by Animal Health and the VLA.

6.5.   It is assumed that in the UK approximately 850 holdings with *fewer* than 1,000 birds, and 1,341 holdings with *more* than 1,000 birds will be required to conduct operator sampling. All premises will need to be audited. It is assumed a further 480 operators of rearing holdings will be required to sample their birds at day old, and just before moving to laying accommodation.

6.6.   The costs of sampling are estimated to be £18.50 per sample for laboratory testing (one pooled sample required from each flock), £16 per hour for operator time (assume two hours is required per holding on each sampling occasion), £1.50 for equipment to collect samples (assume two sets per flock) and a total of £150 for Animal Health time (a base fee, plus a charge per half hour for two hours) when Competent Authority sampling is required. For those keepers who are already sampling to the requirements it is assumed that only the additional costs of the legislation are incurred (any extra testing occasions, the costs of AH time etc). For example, members of the Lion Code already sample flocks just before depopulation.

6.7.   The administration costs for operators include the cost of familiarisation with legislation (two hours per annum at £16 per hour), the costs of keeping records of test results (six hours per annum), the costs of accompanying inspectors around the unit (two hours per annum) and the cost of producing records for inspection (half an hour per annum).

6.8.   Estimates of the costs for official control sampling for layers are based on charges due to be applied to breeding flock holdings from August 2007. The table below sets out the basis of the proposed charges.

Service provided	Service provider	Unit costs
Taking or supervising the taking of official control samples	Animal Health where not carried out by the Independent Control Body	Base fee £32 plus investigation fee of £23 per ½ hour (or part thereof)
Examination of Official Control Samples	Veterinary Laboratories Agency	£18.50 per sample

On the basis of the above assumptions the estimated annual cost to a keeper with 5 flocks and more than 1,000 birds is estimated to be £745.

The estimated annual cost to a keeper with 2 flocks and a total of more than 1,000 birds (and who will be required to comply with CA sampling) is estimated to be £496 per annum:

Operator testing:
£1.50 x4 for equipment to collect the four samples
£18.50 x2 to test the two pooled samples
£16 x(2/5) x2 for operator time (since it is assumed it takes two hours for a 5 flock holding it is assumed it will take two fifths of this time for a 2 flock holding)
All above multiplied by 2.5 (one flock tested three times, one two)

CA testing:
£46 x2 + £32 for two hours of Control Body time (plus base fee) to take samples and audit
£1.50 x2 for equipment to collect two samples
£18.50 to test the pooled sample

Admin burden:
£200 (familiarisation with requirements and keeping records)
Total: £496

The estimated annual cost to a keeper with 1 flock of 500 birds is estimated to be £284:

Operator testing:
£1.50 x2 for equipment to collect the two samples
£18.50 x1 for testing the pooled sample
£16 x(2/5) for operator time (since it is assumed it takes two hours for a 5 flock holding it is assumed it will take a fifth of this time for a 1 flock holding)
All above multiplied by three (three test occasions per year)

Admin burden:
£200 (familiarisation with requirements and keeping records)
Total: £284

The increase in costs to keepers who are, for example, members of an assurance scheme and are already sampling to the required specifications will be less.

6.9.   As stated above option 3 assumes that the management of the auditing and collection of CA and operator samples will be shared jointly by industry and government. In practice this will mean for Lion Code producers auditing and collection of official control samples will be conducted by BEIC auditors, National Britannia. For the purposes of estimating the costs of option 3, it is assumed that 50% of producers required to comply with official control sampling (i.e. producers with more than 1,000 birds) will be covered by National Britannia. Therefore they will not incur any costs of Animal Health time, nor the time accompanying Animal Health inspectors.

The total annual cost of Option 3 is therefore estimated to be £1.4 million, of which £265,000 is the estimated administrative burden.

7.   Measures to be taken if *Salmonella* is detected on a holding.

7.1.   From 1 January 2009 eggs originating from infected flocks cannot be sent for human consumption unless they are heat treated. It is likely that continuing production from that flock would not be financially viable. The financial implications for producers will depend largely on the health status of their flocks.

7.2.   The RIA recognised that this requirement would represent the largest implementation cost to producers. This was offset against the benefits of the NCP which were the projected annual reduction in costs of human *Salmonella* resulting from the controls. Since the costs of heat treatment are linked to the prevalence of *Salmonella* these should decline as *Salmonella* levels fall and the cost benefits rise.

8.   Holdings linked to specific *Salmonella* food-poisoning outbreaks.

8.1.   Eggs will require heat treatment from November 2007 if an epidemiological link was conclusively established between a foodborne outbreak and eggs from a flock infected with <u>any</u> strain of *Salmonella* (not just *S*. Enteritidis or *S*. Typhimurium). Demonstrating a definite link between an outbreak of *Salmonella* in humans with eggs from a specific holding requires detailed investigation. In coming years better techniques for tracing *Salmonella* may develop. For the IA we will assume that one holding per annum will be linked to a specific outbreak. The estimated costs for an affected holding are the same as those set out below for measures taken if *Salmonella* Enteritidis or Typhimurium is suspected on a holding.

9.   Costs of measures taken if *Salmonella* Enteritidis or Typhimurium is suspected on a holding.

9.1.   Methodology for Calculating Number of Infected Hens.

9.1.1.   The current prevalence rate is 8%, in following years, this figure will fall, assuming the target of a 10% reduction each year is met, to 7.2%, then 6.5% and finally 5.8%. This figure refers to the proportion of holding infected. In order to estimate the cost of measures if *Salmonella* is detected on a holding it is first necessary to calculate the number of infected birds in each year. The proportion of hens infected will be higher than the 8% figure (which is the holdings prevalence) because of the greater prevalence in larger holdings with more hens. There is no firm information on the number of infected flocks on an infected holding, so we have used a VLA estimate, based on limited studies, that 65% of flocks on a positive holding would be infected.

9.1.2.   The proportion of eggs infected in a year will not be the same as the proportion of hens. Whilst the proportion of hens infected will be higher than the average prevalence rate this will not necessarily be the case for the proportion of eggs. This is because we assume the average remaining lifespan of a hen is 6 months therefore the proportion of eggs lost through *Salmonella* will be half the proportion of hens infected.

9.1.3.   There are a great number of small holdings with relatively few birds for which the regulation will not in practice apply, these are removed from the estimation. This has been done by considering only the data for holdings with over 500 birds. This is the only stratification of the data available and provides a reasonable estimate.[1]

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[1] *Annex 5 of the NCP which is from the "Baseline Study on the Prevalence of Salmonella in Laying Flocks of Gallus gallus in the EU: FINAL REPORT FROM THE UNITED KINGDOM", the SANCO/34/2004*

9.1.4. The prevalence rates for the different holding size ranges as used above are then applied to the remaining data. This has been done by summing the holding size specific prevalence of SE and ST in the source document.[2]

Number of Birds	500-999	1000-2999	3000-4999	5000-9999	10000-29999	> 30000
% SE & ST Prevalence	8.0%	3.2%	3.6%	3.0%	6.0%	28.2%

9.1.5. As the holding size specific prevalence data was calculated using a different holding size data set to the one used in this IA, a method for transposing the varying prevalence rate onto our holdings data whilst maintaining the overall average of 8% average is used.

9.1.6. This is done by way of a proxy for the different prevalence rates. The average holding size in each range is multiplied by the factor that the prevalence is larger than the average 8%. For example, if average holding size for the 20,000-29,999 was 25,000 and the prevalence rate for this group was 16% instead of the average of 8% then we would double the average hens per holding to 50,000. This figure is then used in the calculation of the number of infected hens (using the 8% prevalence rate) which means that the final result for infected hens and hence eggs in that holding size group will take account of the increased prevalence.

9.1.7. The final number of infected hens is a total of all infected hens in each holding size range taking account of the assumption that only 3/5th of flocks on holdings will be infected.

9.1.8. This method is applied to each year based on the estimated average prevalence in that year, but maintaining the prevalence weightings for the different holding sizes. The change prevalence rate is set at the target in the NCP which is a 10% reduction per year. Hence we are able to estimate the number of infected hens and the number of potentially infected eggs in each year.

9.2.   Methodology for Calculating the Cost of Different Control Options.

9.2.1. If the farmer chooses to keep the infected hens and treat the eggs we assume the remaining hens have an average life expectancy of six months and so the eggs produced for those six months will need to be treated before sale and therefore the cost will be multiplied by the infected eggs produced get the total cost of this option.

9.2.2. If the farmer chooses to keep the infected hens for the remainder of their life but simply destroy the eggs that the hens produce the cost will be the number of infected eggs produced multiplied by the cost of destroying them.

9.2.3. The cost of culling the flock when *Salmonella* is detected is calculated by multiplying the number of infected hens we expect in a given year by the cost of culling and disposal of the infected hens.

9.2.4. The cost of the control measures will not apply until 2009 when the requirement for heat treatment of eggs from infected flocks comes into force. The NCP begins in 2008 and therefore sampling costs have been added from this date.

9.2.5. Affected holdings will have to repeat an official sample from all flocks on the holding, which is estimated to cost £380 per suspected holding (including Control Body time, operator time, laboratory costs and equipment). This will be paid for by government. Assuming this is found to be positive as well, then the supply of untreated eggs into the human food chain will be prevented from the infected flocks. However farmers will be offered the option of requesting the collecting

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[2] *Baseline Study on the Prevalence of Salmonella in Laying Flocks of Gallus gallus in the EU: FINAL REPORT FROM THE UNITED KINGDOM*

of additional samples to demonstrate that the infection is not present. The owners will be expected to meet the cost of these samples.

9.2.6. If infection is confirmed the keeper of the flock then has to decide whether the eggs can be disposed of and destroyed, or sent for heat treatment and whether the flock should be culled and replaced. If the eggs were disposed of, the farmer would incur the costs of disposal (£0.07 per dozen), and the loss of the value of the eggs (currently £0.55 per dozen). For a farm with 30,000 birds and five flocks, of which three were infected during a year, the cost of disposal is estimated to be £130,000 per year. This will depend on the stage during production that the infection is found: this estimate assumes that each infected flock has a remaining laying period of six months. Experience indicates that the period when infection in flocks is most likely to be identified is at the beginning and the end of lay.

9.2.7. If the eggs went for treatment, the loss to farmers would be approximately £0.21 per dozen eggs (as against a loss of £0.55 plus £0.07 per dozen eggs for disposal). For the same farm with 30,000 birds and the same assumptions as above, the cost of treating the eggs is estimated to be £45,000 per year.

9.2.8. If the flock was culled, the farmer would lose the remaining value from the culled birds (the birds are assumed to be an average age of 46 weeks, with a value of £2). The birds would also need to be culled and incinerated at an assumed cost of £0.20 each. For the same illustrative farm as above, with the same assumptions about flock size and number of birds infected, costs are estimated to be approximately £40,000. The birds do not have to be culled: they could be kept for the production of eggs intended for heat treatment. However this would not be a profitable option for many farmers and it is expected that most would choose to cut their losses and have the birds culled.

9.2.9. Whichever option farmers chose, before a new flock could be placed in the house, the house would need to be cleaned and disinfected (in most cases enhanced cleansing and disinfection would be required which would lead to increased cost) and samples taken and tested to ensure no remaining infection. This testing is estimated to cost approximately £230 per holding.

9.2.10. The total costs of the control measures on eggs from infected flocks required by the NCP are below. These estimates assume a starting prevalence of 8% as indicated by the layer survey.

Year	2008	2009	2010	2011
Prevalence	8.0%	7.2%	6.48%	5.83%
Number hens infected (million)	N/A	4.05	3.64	3.28
Total eggs infected (million)	N/A	561	505	454
Heat treatment (million) of eggs or	N/A	£9.8	£8.8	£7.9
Disposal (million) of eggs or	N/A	£29.0	£26.1	£23.5
Cull (million)	**N/A**	**£9.2**	**£8.3**	**£7.4**

Discounted

Year	2008	2009	2010	2011
Heat treatment (million) of eggs or	N/A	£9.5	£8.2	£7.2
Disposal (million) of eggs or	N/A	£28.0	£24.3	£21.2
Cull (million)	N/A	£8.9	£7.7	£6.7

Of these costs, all but approximately £45,000 (for confirmatory official control sampling) are expected to be borne by industry. It is anticipated that industry will choose the cheapest option for them (culling the flock) and therefore the shaded figures should be seen as the likely total costs of the control measures.

Present Value of Control Costs

Year	PVC
Heat treatment (million) of eggs or	£24.9
Disposal (million) of eggs or	£73.5
Cull (million)	£23.3

Total Discounted Costs of the National Control Programme

The total costs of the sampling and the controls ("cull" was selected as the lowest cost option) on eggs from infected holdings, are estimated in the table below according to the different implementation options for the Competent Authority sampling:

Year	2008	2009	2010	2011
TOTAL (Option 3 plus control measures) (million)	£1.4	£10.2	£9.0	£8.0

Present Value of Sampling and Control Costs

Year	PVC
TOTAL (Option 3 plus control measures) (million)	£28.6

10.   Benefits of the National Control Programme.

10.1.   The benefit of the measures is that they reduce the risk to human health from the dissemination of *Salmonella* Enteritidis and Typhimurium into the environment from infected laying flocks and humans.

10.2.   The cost used for a case of *Salmonella* that required two weeks off work was £862 (average male weekly earnings of £431 were used). The cost for an unreported case of *Salmonella* was assumed to be one day off work (at £86 per day).

10.3.   Government policy appraisal uses a well-developed standard approach to valuing a reduction in the risk of fatality which is known as the statistical value of preventing a fatality (or VPF) and expressed in terms of £ per life saved. Typically this value is estimated by asking individuals about the amount they would be willing to pay to reduce the risk of death by a specified percentage.

10.4. Studies of the public willingness to pay to avert a death in other policy areas suggest that people *are* prepared to put an implicit value on the resources that should be committed to protecting people from a given disease or from death. The standard VPF value used in policy appraisal of road schemes in the UK is about £1 million. This was the figure used for the value of preventing a fatality from *Salmonella*.

10.5. There is a wide range given for the benefits because there are no accurate figures for the number of human *Salmonella* cases each year, as many minor cases are never reported to a doctor or the authorities. As a result, although the number of *Salmonella* cases reported in 2005 was approximately 12,800, the real number may be three times this. Hence estimates have been provided for both 12,800 cases and 38,400 cases per year. It is assumed that a reported case is likely to be more serious and require two weeks off work, whereas an unreported case will be more minor and require a day off work. The number of deaths in England and Wales due to *Salmonella* was 119 in 2000 and so it is estimated using the size of the populations of England and Wales that 112 deaths occurred in England. It is assumed that there are no further unreported deaths due to *Salmonella*.

10.6. The following reasoning has been used when calculating the benefits. From 2008 to 2009 prevalence will drop by 10% from 8% to 7.2% as the prevalence has not changed in 2008 no benefits will apply in this year. In 2009 the requirement for regular screening and heat treatment of infected eggs will result in a significant drop in the number of eggs from infected holdings making it into the food chain. This in turn will result in a significant drop in the number of egg related human cases of *Salmonella*.

10.7. Given that under the NCP tests are carried out every 15 weeks we would expect that on average eggs would only make it into the food chain for 7.5 of those weeks instead of the holding continuing to produce indefinitely. This means that each year only 7.5/52 of eggs from infected holdings that previously made it into the food chain will then do so. Therefore egg related cases of human *Salmonella* will drop to 7.5/52 of the base level in 2009. On top of this, the reduction in prevalence envisaged in the NCP will mean the remaining eggs from infected holding which make it into the food chain will drop by 10% per year and this further reduction can be applied to the egg related human cases of *Salmonella*.

10.8. The benefits of the reduction in human cases of *Salmonella* in each year will depend on the assumption of the proportion of human cases of *Salmonella* which are related to eggs. The base case in this IA is 20%, due to the uncertainty, sensitivities around this of 10% and 30% have been performed. The benefits are presented below.

10% of Human Cases from Infected Eggs

Projected annual reduction in costs of human *Salmonella* resulting from controls				
	2008	2009	2010	2011
TOTAL cost of *Salmonella* (average of maximum and Minimum number of cases) (million) is £65,000,000	£0	£10.8	£11.0	£11.1

Discounted

Projected annual reduction in costs of human *Salmonella* resulting from controls				
	2008	2009	2010	2011
TOTAL cost of *Salmonella* (average of maximum and Minimum number of cases) (million) is £65,000,000	£0	£10.4	£10.2	£10.0

Present Value of Benefits (PVB)

£30.7m

20% of Human Cases from Infected Eggs

Projected annual reduction in costs of human *Salmonella* resulting from controls				
	2008	**2009**	**2010**	**2011**
TOTAL cost of *Salmonella* (average of maximum and Minimum number of cases) (million) is £65,000,000	£0	£21.6	£21.9	£22.2

Discounted

Projected annual reduction in costs of human *Salmonella* resulting from controls				
	2008	**2009**	**2010**	**2011**
TOTAL cost of *Salmonella* (average of maximum and Minimum number of cases) (million) is £65,000,000	£0	£20.9	£20.5	£20.0

Present Value of Benefits

£61.4m

30% of Human Cases from Infected Eggs

Projected annual reduction in costs of human *Salmonella* resulting from controls				
	2008	**2009**	**2010**	**2011**
TOTAL cost of *Salmonella* (average of maximum and Minimum number of cases) (million) is £65,000,000	£0	£32.4	£32.9	£33.4

Discounted

Projected annual reduction in costs of human *Salmonella* resulting from controls				
	2008	**2009**	**2010**	**2011**
TOTAL cost of *Salmonella* (average of maximum and Minimum number of cases) (million) is £65,000,000	£0	£31.3	£30.7	£30.1

Present Value of Benefits

£92.1m

10.9.   Implementation also helps to protect the ability of egg producers to export their products to the EU. In 2006 UK egg producers exported eggs and egg products worth approximately £19 million. Without implementation, there is a risk that these exports would be banned, and although some of the eggs would be redirected into the domestic market, they would still lose value.

11.   Costs and Benefits of the National Control Programme (NPV)

11.1.   By bringing together the costs (PVC) and benefits (PVB) of the regulations we are able to present the net present value of the regulations as a whole. On the cost side the lowest cost options have been chosen as these should represent the actual costs based on farmer and government decision making (assuming the lowest cost options are chosen).

11.2.   For the control costs the lowest cost option is "Cull" and therefore this was used. For sampling costs, options 3 and 4 have the same and lowest cost so these have been used in this calculation.

11.3.   Benefits will vary based on the sensitivity around the human cases of *Salmonella* related to eggs. For this reason three net present values are presented for the different assumptions regarding the benefits.

12.   Results

10% of Human Cases from Infected Eggs:

NPV = £2.12m

20% of Human Cases from Infected Eggs:

NPV = £32.84m

30% of Human Cases from Infected Eggs:

NPV = £63.55m

Specific Impact Tests: Checklist

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	*Results in Evidence Base?*	*Results annexed?*
Competition Assessment	Yes	Yes/No
Small Firms Impact Test	Yes/No	Yes/No
Legal Aid	Yes/No	Yes/No
Sustainable Development	Yes/No	Yes/No
Carbon Assessment	Yes/No	Yes/No
Other Environment	Yes/No	Yes/No
Health Impact Assessment	Yes/No	Yes/No
Race Equality	Yes/No	Yes/No
Disability Equality	Yes/No	Yes/No
Gender Equality	Yes/No	Yes/No
Human Rights	Yes/No	Yes/No
Rural Proofing	Yes/No	Yes/No

1.   Small Firms Impact Test.

1.1   Almost all egg producers would be classified as small or micro businesses, as they employ fewer than 250 full time equivalent employees at the site level. Whilst they may employ more than this at the entire firm level the cost depends on the number of sites and this was considered a fair unit for comparison. If a larger firm had more sites the impact would be proportionally larger.

1.2.   At a holdings level we could expect small business to face an annual sampling and testing cost of £621. This is was calculated as an average of the costs for a keeper with 2 flocks and greater than 1,000 birds and a keeper with 5 flocks and greater than 1,000 birds. For the micro business the sampling and testing cost is £284, a micro firm was considered to have 1 flock of 500 birds. Once again we can see that the cost changes proportionately with the size of the holding and therefore we do not believe there would be significant adverse impacts depending on holding size.

1.3.   With regards to the control costs these will affect larger businesses disproportionately due to the higher prevalence of *Salmonella* on holdings with more birds. As the cost is borne in order to reduce the prevalence of *Salmonella* in particular where the prevalence is highest this is not believed to be an unfair cost.

1.4.   Non-commercial small holdings will not be covered by this legislation and therefore have not been included in the analysis.

2.   Carbon Impact

2.1.   The legislation is not believed to result in any significant change in carbon emissions. Whilst there may be an increase in vehicle movements associated with enforcement these may be mitigated by reduced vehicle movements due to illness (doctors visits, hospital trips etc).

Annex II: Outcome of Specific Impact Tests

Legal Aid

The Proposal does not create new criminal sanctions or civil penalties.

Carbon Impact Assessment

The Proposal will have no significant effect on carbon emissions, as the nature and scale of the laying flock sector is likely to remain the same. There will be individual winners and losers in terms of increased or reduced trade opportunities (in particular large producers who remain *Salmonella* free), and therefore some change to the carbon footprint of individual businesses, but the overall impact for the industry as a whole is unlikely to alter substantially. There could be a slight increase in the carbon footprint of government officials in the initial stages of the NCP who may have to visit layer holdings more frequently.

Other Environmental Issues

As the nature and scale of the layer sector is likely to remain the same, the Proposal has no implications in relation to climate change, waste management, landscapes, water and floods, habitat and wildlife or noise pollution.

Health Impact Assessment

The benefit of the NCP is that it reduces the risk to human health from the dissemination of *Salmonella* Enteritidis and *Salmonella* Typhimurium into the environment from infected laying flocks and humans. Section 10 of the IA looks at this in detail.

Race /Disability/Gender

There are no limitations on meeting the requirements of the NCP on the grounds of race, disability or gender. The legislation does not impose any restriction or involve any requirement which a person of a particular racial background, disability or gender would find difficult to comply with. Conditions apply equally to all individuals and businesses involved in the activities covered by the legislation.

Human Rights

The NCP is consistent with the Human Rights Act 1998.

Rural Proofing

The majority of producers affected by the NCP are based in rural areas. The NCP is likely to have an economic impact which will be specific to those involved in the production of eggs. The IA looks at this in detail.