

www.defra.gov.uk

Consultation on the Codes of Practice for the Control of Salmonella in Animal Feeds

November 2008

Department for Environment, Food and Rural Affairs
Nobel House
17 Smith Square
London SW1P 3JR
Telephone 020 7238 6000
Website: www.defra.gov.uk

© Crown copyright 2008

Copyright in the typographical arrangement and design rests with the Crown.

This publication (excluding the royal arms and departmental logos) may be re-used free of charge in any format or medium provided that it is re-used accurately and not used in a misleading context. The material must be acknowledged as crown copyright and the title of the publication specified.

Information about this publication and further copies are available from:

Defra
Surveillance, Zoonoses, Epidemiology and Risk
Food and Farming Group
Area 4A
Nobel House,
17 Smith Square
London
SW1P 3JR
Tel: 0207 238 6080

Email: zdri@defra.gsi.gov.uk

This document is available on the Defra website:

<http://www.defra.gov.uk/corporate/consult/cop-salmonella/index.htm>

Published by the Department for Environment, Food and Rural Affairs

Contents

Section 1

Code of Practice for the Control of Salmonella:

During the production of compound feeds **4**

Section 2

Code of Practice for the Control of Salmonella:

During the Storage and Transport of Feed compounds, materials
and additives **17**

Section 3

Code of Practice for the Control of Salmonella:

During the production of feed materials and feed additives **29**

Section 1

Code of Practice for the Control of *Salmonella*

During the production of compound feeds

This non-statutory Code of Practice is issued by the Department for Environment Food and Rural Affairs, the Scottish Executive Environment and Rural Affairs Department, the Department of Agriculture and Rural Development (Northern Ireland) and the Welsh Assembly Government. It has been drawn up in consultation with the Agricultural Industries Confederation (AIC), the National Farmers' Union, the Farmers' Union of Wales, the Seed Crushers' and Oil Processors' Association and the Grain and Free Trade Association, Food & Drink Federation, National Farmers' Union Scotland, British Egg Industry Council, British Poultry Council, National Pig Association, Assured Combinable Crops, Genesis QA, Quality Meat Scotland.

Contents	Page
Introduction	7
1. Purpose of the Code	7
2. Definitions	7
3. Manufacture of Compound Feedingstuffs	8
4. Premises	8
5. Equipment	11
6. Cleaning	12
7. Bacteriological Monitoring	12
8. Action to be taken following isolation of <i>Salmonella</i>	14
9. Records	14
10. Transport	15
11. Personnel	15
12. Legislation	15

Introduction

Salmonella organisms may occur in the environment and each link in the food chain, from producers to consumers, has a part to play in reducing the risk of human infection caused by *Salmonella*. Animal feedingstuffs are acknowledged to be one possible route by which *Salmonella* can enter the food chain.

This detailed Code of Practice provides non-statutory guidelines applicable to all feed business operators for establishing good production practices for compound feeds and safeguarding the microbiological quality of feed materials and additives used directly as, or intended for incorporation into, animal feedingstuffs.

The legal basis for the control of *Salmonella* is laid down in:

- Feed Hygiene Regulation EC/183/2005
- Zoonoses Directive 2003/99/EC
- Control of *Salmonella* Regulation EC/2160/2003
- National statutory instruments implementing the above, as amended ¹

The Section on Legislation (12) provides further details.

1. Purpose of the Code

To ensure that compound feedingstuffs are of a satisfactory bacteriological quality and to minimise the risk of *Salmonella* contamination.

2. Definitions

'Compound feedingstuffs' in this code means mixtures of products of vegetable or animal origin in their natural state, fresh or preserved, or products derived from the industrial processing thereof, or organic or inorganic substances, whether or not containing additives, for oral animal feeding in the form of complete feedingstuffs or supplementary feedingstuffs.

Feed (or feedingstuff) in this code means any substance or product, including additives, whether processed, partially processed or unprocessed, intended to be used for oral feeding to animals (Regulation (EC) No 178/2002).

'Feed materials' in this code means various products of vegetable or animal origin, in their natural state, fresh or preserved, and products derived from the industrial processing thereof, and organic or inorganic substances, whether or not containing additives, which are intended for use in oral animal feeding either directly as such or after processing, in the preparation of compound feedingstuffs or as carriers of premixtures.

¹ For the latest legislation, refer to the FSA or Defra websites

Manufacture/Production in this code means all operations including receipt of materials, production, packaging, repackaging, labelling, re-labelling, control, release, storage, and distribution of compound feedingstuffs and the related controls.

3. Manufacture of Compound Feedingstuffs

3.1 Good manufacturing practice

- a) All manufacturing processes should be clearly defined in writing and be capable of achieving the desired results. Procedures should be subject to regular and critical review to ensure that they continue to be effective.
- b) All necessary facilities should be provided, including:
 - i) appropriately trained personnel;
 - ii) individual written procedures, particularly those concerned with the minimisation of contamination;
 - iii) suitable storage and transport as defined in the separate Code of Practice for Storage and Transport of feed compounds, materials and additives.
- c) Adequate records should be maintained to assist the investigation of any positive *Salmonella*.

3.2 Hazard Analysis Critical Control Point (HACCP) systems

- a) There should be a comprehensive system designed, documented, recorded, implemented and controlled, so as to provide assurance that the compound feed will be consistently of a satisfactory bacteriological quality. The techniques of Hazard Analysis Critical Control Points (HACCP) must be applied as required by the Feed Hygiene Regulation (EC 183/2005). The purposes of the bacteriological monitoring provided for in **Section 7** are to provide an indication that bacteriological quality criteria are being met. Corrective actions are defined in the event that these criteria are not met.
- b) The principles of HACCP are defined in Codex Alimentarius Commission Code of Practice – General Principles of Food Hygiene. CAC/RCP 1 1969, Rev. 4 – 2003 (www.codexalimentarius.net).

4. Premises

Principle

Buildings should be located, designed, constructed, adapted and maintained to suit the operations carried out therein.

4.1 Pest control

Feeds should be produced and stored in facilities which protect against the entrance and harbouring of rodents, birds, insects and domestic, wild and feral animals and safe control measures should be regularly applied to exclude them.

- a) There must be an effective pest control programme. This must include:
 - A plan of the site including locations of all bait stations
 - Details of frequency of checks, with records of findings and actions
 - Details of any baits/ chemicals used including Product Safety Data Sheets.
- b) The business should employ a suitably qualified person on site, e.g. holding a British Pest Control Association (BPCA) or equivalent qualification, have a vermin control contract with a BPCA registered company or follow Home Grown Cereals Authority (HGCA) guidance as appropriate.
- c) The control measures must ensure that poison baits cannot contaminate the feed. This may include using non-grain baits and securing bait points to avoid accidental contamination. Where practical, baits should be outside the actual production and storage areas unless there is a current pest problem in these areas. Where shooting is undertaken, non-toxic ammunition must be used.
- d) Waste and scrap materials, old pallets, overgrowth of vegetation or other materials which can encourage and harbour rodents must be removed from the proximity of the building. In particular, feed spills should be promptly removed. Proactive prevention is more effective than corrective action.

4.2 Production on livestock units

Where the production facility is located on the same premises as a livestock enterprise the production and storage area, including loading and unloading areas must be secure and clearly separate from the livestock enterprise and must not share a common enclosed airspace with the livestock.

Vehicle access must be regularly cleaned or otherwise kept free as far as practicable from any material which has come into contact with farm animals and from livestock faeces, litter and effluent. A separate access to the production facility may be necessary.

Livestock buildings must not drain onto the production facility or onto its access.

Buildings previously used to house animals or store their waste must first have been thoroughly cleaned to remove all organic material, disinfected and dried.

Trailers, loaders etc. which have been used for other purposes should be similarly treated.

Special attention should be paid to control of pests and restriction of the access of pets, feral animals or poultry into feed production areas.

4.3 Building construction and layout

- a) The buildings should be soundly constructed of durable materials and fully enclosed or otherwise proofed against pests/vermin and weather.
- b) The construction and surface finish of floors should be appropriate for the process carried out. They should be maintained in a clean and good state of repair. Floors and walls which may come into contact with feed or feed materials should have surfaces which are readily cleanable.
- c) Walls and ceilings should be clean and maintained in a good state of repair.
- d) Doors should be soundly constructed, close fitting and, where at all possible kept closed other than for personnel entry or for the inward or outward movement of feed. If it is necessary for ventilation purposes to open doors then suitable precautions should be taken to ensure this does not increase the risk of vermin and wild birds gaining entry.
- e) There should be sufficient clean hard standing at entrances and exits to minimise the tracking in of mud, effluent and other wet material by vehicles or personnel.
- f) The site should be well drained. Drains should be of adequate size and should be laid in accordance with the requirements of the local authority or other authorities having jurisdiction. They should have adequate trapped gullies and be properly ventilated.
- g) Plant layout should avoid creating uncleanable recesses. In order to avoid dust containing *Salmonella* from contaminating the finished product, the intake to the processing area and any dust extraction should be physically separated from areas used to store and despatch the finished feed.
- h) The buildings should be effectively lit and ventilated, with air control facilities appropriate to both the operations undertaken within them and to the external environment. Steps should be taken to ensure that air used to cool extrusions is suitable for that purpose and is not a potential source of contamination.

4.4 Plant operations

- a) The factory site, processing areas, laboratories and stores should be maintained in a clean and tidy condition and be free from accumulated waste.
- b) Waste material should be collected in suitable covered receptacles for removal to collection points away from the production areas. It should be disposed of at frequent intervals.
- c) Whenever possible, operation areas should not be used as a general right of way for personnel or materials passing through to other parts of the premises.
- d) The operations carried out in any particular area of the premises should be such as to minimise the risk of contamination of one feed by another.

4.5 Storage areas

- a) A programme should be drawn up to ensure that all storage facilities are completely emptied and cleaned regularly and according to the type and condition of feed stored. Where appropriate storage areas should enable goods to be stored to allow their maintenance in a clean, dry and orderly condition. Keeping feeds dry is important since *Salmonella* needs moisture to multiply.
- b) Goods which have been rejected, recalled or returned should be placed in separate and adequately segregated storage to preclude contamination of other materials and products.
- c) Any store which has been used to contain feeds contaminated with *Salmonella* should be decontaminated before use for other products.
- d) Storage bays/bins/silos should be organised to permit suitable and effective separation and identification of the various feeds.

5. Equipment

Any equipment used to process, load, unload or otherwise handle feeds should be suitable for the purpose for which it is being used and should be maintained in a clean condition.

Any equipment used to handle materials which could be a source of contamination, or feedingstuffs which are known to be contaminated, should be thoroughly cleaned, sanitised and if necessary dried before being used to handle other feeds.

6. Cleaning

The accumulation of dust and feed remains must be minimised since they form a breeding ground for bacteria, and can also attract pests.

- a) There must be a planned cleaning programme, based on risk analysis, including methods, frequency and times of the cleaning and identifying who should carry out the cleaning. This programme should pay particular attention to parts of the plant which have been identified in the HACCP study as areas where stale feed might accumulate.
- b) The chemicals used for cleaning feed contact surfaces must be suitable for this purpose, and used in accordance with the manufacturer's instructions.
- c) The residues of cleaning chemicals on feed contact surfaces must be minimised, and must not pose a threat to feed safety.
- d) Machinery which comes into contact with dry feed must be dried after wet cleaning or must be dry when they are to be used again. Because bacteria need moisture to grow, wet cleaning is often undesirable and should only be used where shown to be necessary as part of the HACCP plan and should always include disinfection with effective disinfectants at suitable concentration.
- e) Cleaning activities must be recorded.

7. Bacteriological Monitoring

7.1

All compound feedingstuffs for supply or sale and feed materials, additives, production plant and equipment and the production environment must be subject to monitoring for the presence of *Salmonella*. Frequency of sampling and testing should be based on a risk assessment taking into account:

- the intended use of the feed
- bacteriological risks inherent in the process
- nature of feed materials or additives and their sources
- past results

It is recommended that dust samples from key areas of the mill should be tested on a regular basis as well as testing feed materials and finished feed. Such samples could include dust emanating from intake pit augers, ingredient sieves, ingredient storage bins, pellet or meal coolers, pellet shakers finished product outloading gantry and main dust aspiration system. Any regular findings of *Salmonella* from these areas should be further investigated, particularly if the same serovar is repeatedly found in cooler areas, pellet shakers or dust aspiration.

The aim of the monitoring is to:

- a) check on the bacteriological quality of the feed and production environment; and,
- b) to take any necessary corrective action.

The information gained by this monitoring should be used to help select sources of feed materials or additives, which may consistently provide the desired quality in the compound feedingstuffs produced or to monitor the effectiveness of microbiological hygiene in the manufacturing facility.

7.2 Sampling frequency

Samples should be taken according to a schedule based on risk assessment. The schedule should be planned and reviewed on a regular basis, in the light of results obtained. Sampling of incoming materials, finished products and the production environment should be considered in the sampling schedule.

7.3 Sampling

- a) Samples must only be taken by trained operatives.
- b) Sampling equipment (including the sample bag) must be clean.
- c) No contact must be made between the sample and the skin.
- d) The use of inverted plastic sampling bags is recommended.
- e) Samples (including composites) must be fully identifiable to allow full traceability in the case of isolation of *Salmonella*. Information on the type of material, country of origin and species for which feed is intended (if the sample is from a finished feed) should be recorded on the submission form supplied to the testing laboratory.
- f) Samples should be stored and transported in cool, dry conditions.

Samples where appropriate must be collected, handled and tested in accordance with approved methods laid down in **The Animal By-Products Regulations 2005** (SI No 2005/2347)² at a Defra listed laboratory as approved under those Regulations or **ISO 17025**. *Salmonella* isolates must be serotyped by approved serotyping reference methods in an accredited laboratory and reported to Defra and if appropriate, the relevant devolved administration.

² The Animal By-Products Regulations 2005 requires any person carrying on a business involving the processing of animal protein to register their business with Defra and take samples of processed material for testing for the presence of *Salmonella*, using the approved methods set out in Part II of Schedule 3 to the Regulations, and at a laboratory authorised by Defra, each day that product is consigned from the premises. There are separate versions of these Regulations in England, Scotland, Wales and Northern Ireland.

Ideally the isolates should be sent directly to Veterinary Laboratories Agency who will carry out full serotyping free-of-charge.

8. Action to be taken following isolation of *Salmonella*

The action to be taken following the isolation of *Salmonella* will depend on the circumstances of the isolation. The following should be considered by the feed compounder:

Incoming materials:

- Clean and flush intake, routes and storage
- Vehicle cleaning (whether own vehicles or third party)
- Consider additional cleaning of plant and equipment
- Review test frequency and finished product test results

Finished products:

- Carry out traceability to identify the source of contamination
- Additional cleaning of storage and vehicles (where appropriate)
- Consider additional cleaning of plant and equipment
- Review finished product and environment test frequency and results

Environment:

- Additional cleaning of plant and equipment
- Environmental screening follow up
- Review environmental test frequency

In all cases the following should be advised of isolations of *Salmonella*:

- Defra³
- if required by the contract, the purchaser

9. Records

Suitable records should be maintained, and kept for a minimum period of two years, and may be required by enforcement officers and should be made available on request. The records should show:

- Details of movements of compound feeds and where appropriate raw materials for the process into and out of the production facility.
- Details of samples taken and dates of sampling and testing.
- Details of all *Salmonella* test results including serotypes where appropriate.
- Details of actions taken following any *Salmonella* isolation.

³ The Zoonoses Order 1989 requires laboratories to report all isolations of *Salmonella* from animal/poultry feedstuffs and ingredients to Defra.

10. Transport

See separate Code of Practice for Storage and Transport of feed compounds, materials and additives.

11. Personnel

11.1

The aim should be to ensure that there are sufficient personnel with the ability, training and expertise necessary to make sure that the provisions of the Code are applied. All personnel who may be involved in the manufacture of compound feedingstuffs should be given clear guidance and instruction on their duties. Training should cover not only specific tasks but good hygiene practice generally and the importance of personal hygiene.

11.2

All sampling, cleaning, pest control, etc programmes should be the clear responsibility of specific named member(s) of staff or contractor(s).

11.3

All personnel should wear overalls or other appropriate garments. These should be regularly and frequently cleaned. All personnel entering the facility from a livestock enterprise should sanitise their hands and put on clean overalls and footwear when entering.

Eating and drinking should only be permitted within designated areas of the facility. Cloakroom and toilet facilities, where provided, should be kept clean.

11.4

No person known to be suffering from a communicable enteric disease should be employed in the manufacture of compound feedingstuffs if they are likely to come into direct contact with feeds or feed material.

12. Legislation

The Feed Hygiene Regulation (EC 183/2005) requires feed business operators to comply with standards concerning facilities and equipment, personnel, storage, transport and record-keeping. Feed businesses (except most farms) also have to apply the principles of HACCP. A number of the requirements of the Regulation are reflected in the guidance set out in this voluntary code for the control of *Salmonella*. However, feed business operators must observe the entirety of the Regulation as it applies to their feed business activities. A copy of EC Regulation 183/2005 can be found at:

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32005R0183:EN:HTML>

The Feed (Hygiene and Enforcement) Regulations 2005 provide for national enforcement (offences and penalties) and other administrative provisions in relation to EC Regulation 183/2005. There are separate and parallel Regulations for England, Scotland, Wales and Northern Ireland.

Further copies can be obtained from Defra Publications, Admail 6000, London SW1A 2XX (Tel: 0845 9556000)

© Crown copyright 1989 Revised July 2008 PB 2202

Section 2

Code of Practice for the Control of *Salmonella*

**During the Storage and Transport of Feed compounds,
materials and additives**

This non-statutory Code of Practice is issued by the Department for Environment Food and Rural Affairs, the Scottish Executive Environment and Rural Affairs Department, the Department of Agriculture and Rural Development (Northern Ireland) and the Welsh Assembly Government. It has been drawn up in consultation with the Agricultural Industries Confederation (AIC), the National Farmers' Union, the Farmers' Union of Wales, the Seed Crushers' and Oil Processors' Association and the Grain and Free Trade Association, Food & Drink Federation, National Farmers Union Scotland, British Egg Industry Council, British Poultry Council, National Pig Association, Assured Combinable Crops, Genesis QA, Quality Meat Scotland.

Contents	Page
Introduction	20
1. Purpose of the Code	20
2. Definitions	20
3. Hazard Analysis Critical Control Points (HACCP)	20
4. Premises	21
5. Equipment	23
6. Vehicles	24
7. Cleaning	24
8. Bacteriological monitoring	25
9. Action to be taken following isolation of <i>Salmonella</i>	26
10. Records	27
11. Personnel	27
12. Legislation	28

Introduction

Salmonella organisms may occur in the environment and each link in the food chain, from producers to consumers, has a part to play in reducing the risk of human infection caused by *Salmonella*. Animal feedingstuffs are acknowledged to be one possible route by which *Salmonella* can enter the food chain.

This detailed Code of Practice provides non-statutory guidelines applicable to all feed business operators for establishing good production practices for compound feeds and safeguarding the microbiological quality of feed materials and additives used directly as, or intended for incorporation into, animal feedingstuffs.

The legal basis for the control of *Salmonella* is laid down in:

- Feed Hygiene Regulation EC/183/2005
- Zoonoses Directive 2003/99/EC
- Control of *Salmonella* Regulation EC/2160/2003
- National statutory instruments implementing the above, as amended⁴

The Section on Legislation (12) provides further details.

1. Purpose of the Code

To ensure that the bacteriological quality of feeds is maintained during storage and transport and to minimise the risk of *Salmonella* contamination. It is the responsibility of storekeepers and hauliers to meet the requirements of this code.

2. Definitions

Feed in this code means any substance or product, including additives, whether processed, partially processed or unprocessed, intended to be used for oral feeding to animals (Regulation (EC) No 178/2002).

3. Hazard Analysis Critical Control Points (HACCP)

- a) There should be a comprehensive system designed, documented, recorded, implemented and controlled, so as to provide assurance that the feeds will be consistently of a satisfactory bacteriological quality. The techniques of Hazard Analysis Critical Control Points (HACCP) must be applied as required by the Feed Hygiene Regulation (EC 183/2005). The purposes of the bacteriological monitoring provided for in **Section 8** are to provide an indication that bacteriological quality criteria are being met. Corrective actions are defined in the event that these criteria are not met.

⁴ For the latest legislation, refer to the FSA or Defra websites

- b) The principles of HACCP are defined in Codex Alimentarius Commission Code of Practice – General Principles of Food Hygiene. CAC/RCP 1 1969, Rev. 4 – 2003 (www.codexalimentarius.net).
- c) the HACCP risk assessment process must consider the potential contamination from other materials stored or transported.

4. Premises

Principle

Buildings should be located, designed, constructed, adapted and maintained to suit the operations carried out therein.

4.1 Pest control

Feed materials and additives should be produced and stored in facilities which protect against the entrance and harbouring of rodents, birds, insects and domestic, wild and feral animals and safe control measures should be regularly applied to exclude them.

- a) There must be an effective pest control programme. This must include:
 - A plan of the site including locations of all bait stations
 - Details of frequency of checks, with records of findings and actions
 - Details of any baits/ chemicals used including Product Safety Data Sheets.
- b) The store should employ a suitably qualified person on site, e.g. holding a British Pest Control Association (BPCA) or equivalent qualification, have a vermin control contract with a BPCA registered company or follow Home Grown Cereals Authority (HGCA) guidance as appropriate.
- c) The control measures must ensure that poison baits cannot contaminate the feed. This may include using non-grain baits and securing bait points to avoid accidental contamination. Where practical, baits should be outside the actual production and storage areas unless there is a current pest problem in these areas. Where shooting is undertaken, non-toxic ammunition must be used.
- d) Waste and scrap materials, old pallets, overgrowth of vegetation or other materials which can encourage and harbour rodents must be removed from the proximity of the building. In particular, feed spills should be promptly removed. Proactive prevention is more effective than corrective action.

4.2 Storage on livestock units

Where the storage facility is located on the same premises as a livestock

enterprise loading and unloading areas must be secure and clearly separate from the livestock enterprise and must not share a common enclosed airspace with the livestock.

Vehicle access must be regularly cleaned or otherwise kept free as far as practicable from any material which has come into contact with farm animals and from livestock faeces, litter and effluent. A separate access to the production facility may be necessary.

Livestock buildings must not drain onto the storage facility or onto its access.

Buildings previously used to house animals or store their waste must first have been thoroughly cleaned to remove all organic material, disinfected and dried. Trailers, loaders etc. which have been used for other purposes should be similarly treated.

Special attention should be paid to control of pests and restriction of the access of pets, feral animals or poultry into feed production areas.

4.3 Building construction and layout

- a) The buildings should be soundly constructed of durable materials and fully enclosed or otherwise proofed against pests/vermin and weather.
- b) The construction and surface finish of floors should be appropriate for the process carried out. They should be maintained in a clean and good state of repair. Floors and walls which may come into contact with feed or feed materials should have surfaces which are readily cleanable.
- c) Walls and ceilings should be clean and maintained in a good state of repair.
- d) Doors should be soundly constructed, close fitting and, where at all possible kept closed other than for personnel entry or for the inward or outward movement of feeds. If it is necessary for ventilation purposes to open doors then suitable precautions should be taken to ensure this does not increase the risk of vermin and wild birds gaining entry.
- e) There should be sufficient clean hard standing at entrances and exits to minimise the tracking in of mud, effluent and other wet material by vehicles or personnel.
- f) The site should be well drained. Drains should be of adequate size and should be laid in accordance with the requirements of the local authority or other authorities having jurisdiction. They should have adequate trapped gullies and be properly ventilated.
- g) Plant layout should avoid creating uncleanable recesses. In order to avoid dust containing *Salmonella* from contaminating the finished product, the intake to the processing area and any dust extraction should be

physically separated from areas used to store and despatch the finished feed.

- h) The buildings should be effectively lit and ventilated, with air control facilities appropriate to both the storage operations undertaken within them and to the external environment. Steps should be taken to ensure that air used to ventilate stores is suitable for that purpose and is not a potential source of contamination.

4.4 Store operations

- a) The stores should be maintained in a clean and tidy condition and be free from accumulated waste.
- b) Waste material should be collected in suitable covered receptacles for removal to collection points away from the storage areas. It should be disposed of at frequent intervals.
- c) Whenever possible, storage areas should not be used as a general right of way for personnel or materials passing through to other parts of the premises.
- d) The operations carried out in any particular area of the premises should be such as to minimise the risk of contamination of one product by another.

4.5 Storage areas

- a) A programme should be drawn up to ensure that all storage facilities are completely emptied and cleaned regularly and according to the type and condition of feed stored. Where appropriate storage areas should enable goods to be stored to allow their maintenance in a clean, dry and orderly condition. Keeping feed materials and additives dry is important since *Salmonella* need moisture to survive and multiply.
- b) Goods which have been rejected, recalled or returned should be placed in separate and adequately segregated storage to preclude contamination of other materials and products.
- c) Any store which has been used to contain feed materials contaminated with *Salmonella* should be decontaminated before use for other products.
- d) Storage bays/areas should be organised to permit suitable and effective separation and identification of the various feed materials.

5. Equipment

Any equipment used to process, load, unload or otherwise handle feeds should be suitable for the purpose for which it is being used and should be maintained in a clean condition.

Any equipment used to handle materials which could be a source of contamination, or feeds which are known to be contaminated, should be thoroughly cleaned, sanitised and if necessary dried before being used to handle other feeds.

6. Vehicles

All vehicles and containers, to be used for carrying dry feeds, including those operated by third parties, should be inspected at the time of loading and found to be clean and dry before being used for the transport of feeds.

All vehicles and containers to be used for carrying moist and liquid feeds, including those operated by third parties, should be inspected at the time of loading and found to be in an appropriate condition for the feed concerned in accordance with written procedures.

All vehicles (and containers as above) used for transport of feeds should be subjected to a risk based cleaning and sanitising programme to ensure they are maintained in a clean state with no build up of waste material. Ideally, separate vehicles should be designated specifically for feeds but it is recognised that resources may not allow this. Therefore, if vehicles are used for the carriage of other goods or materials, they should be thoroughly cleaned, sanitised and dried before being used to transport feeds.

Feeds should be protected from contamination during transport. The vehicle / trailer load area should be covered/sheeted at all times except during loading, unloading and sampling. Any cover so used should be maintained in a clean and sound condition and should be cleaned, sanitised and dried before use if it has been used to cover other materials or goods.

7. Cleaning

The accumulation of dust and feed remains must be minimised since they form a breeding ground for bacteria, and can also attract pests.

- a) There must be a planned cleaning programme, including methods, frequency and times of the cleaning and identifying who should carry out the cleaning.
- b) The chemicals used for cleaning feed contact surfaces must be suitable for this purpose, and used in accordance with the manufacturer's instructions.
- c) The residues of cleaning chemicals on feed contact surfaces must be minimised, and must not pose a threat to feed safety.
- d) Machinery which comes into contact with dry feed must be dried after wet cleaning or must be dry when they are to be used again. Because bacteria need moisture to grow, wet cleaning is often undesirable and should only be used where shown to be necessary as part of the HACCP

plan and should always include disinfection with effective disinfectants at suitable concentration.

- e) Cleaning activities must be recorded.

8. Bacteriological Monitoring

8.1

The store environment, plant and equipment (including vehicles) must be subject to monitoring for the presence of *Salmonella*. Consideration should be given to sampling and testing incoming and outgoing feed. Frequency of all sampling and testing should be based on a risk assessment taking into account:

- the intended use
- inherent bacteriological risks
- nature and sources
- past results

It is recommended that dust samples from key areas of the mill should be tested on a regular basis as well as testing feed materials and finished feed. Such samples could include dust emanating from intake pit augers, ingredient sieves, ingredient storage bins, pellet or meal coolers, pellet shakers finished product outloading gantry and main dust aspiration system. Any regular findings of *Salmonella* from these areas should be further investigated, particularly if the same serovar is repeatedly found in cooler areas, pellet shakers or dust aspiration.

The aim of the monitoring is to:

- a) check on the environmental hygiene of the store; and,
- b) if necessary, to take any necessary corrective action.

8.2 Sampling frequency

Samples should be taken according to a schedule based on risk assessment. The schedule should be planned and reviewed on a regular basis, in the light of results obtained. Sampling of the storage environment, plant and equipment, vehicles, incoming and outgoing materials should be considered in the sampling schedule.

8.3 Sampling

- a) Samples must only be taken by trained operatives.
- b) Sampling equipment (including the sample bag) must be clean.

- c) No contact must be made between the sample and the skin.
- d) The use of inverted plastic sampling bags is recommended.
- e) Samples (including composites) must be fully identifiable to allow full traceability in the case of isolation of *Salmonella*. Information on the type of material, country of origin and species for which feed is intended (if the sample is from a finished feed) should be recorded on the submission form supplied to the testing laboratory.
- f) Samples should be stored and transported in cool, dry conditions.

Samples where appropriate must be collected, handled and tested in accordance with approved methods laid down in **The Animal By-Products Regulations 2005** (SI No 2005/2347)⁵ at a Defra listed laboratory as approved under those Regulations or **ISO 17025**. *Salmonella* isolates must be serotyped by approved serotyping reference methods in an accredited laboratory and reported to Defra and if appropriate, the relevant devolved administration. Ideally the isolates should be sent directly to Veterinary Laboratories Agency (VLA) who will carry out full serotyping free-of-charge.

9. Action to be taken following isolation of *Salmonella*

The action to be taken following the isolation of *Salmonella* will depend on the circumstances of the isolation. The following should be considered by the Store operator.

Incoming materials:

- Vehicle cleaning (whether own vehicles or third party)
- Consider additional cleaning of plant and equipment
- Review test frequency and test results on outgoing loads and environment

Outgoing materials:

- Carry out traceability to identify the source of contamination
- Additional cleaning of storage and vehicles (where appropriate)
- Consider additional cleaning of plant and equipment
- Review outgoing materials and environment test frequency and results

Environment:

- Additional cleaning of storage areas, plant and equipment
- Environmental screening follow up
- Review environmental test frequency

⁵ The Animal By-Products Regulations 2005 requires any person carrying on a business involving the processing of animal protein to register their business with Defra and take samples of processed material for testing for the presence of *Salmonella*, using the approved methods set out in Part II of Schedule 3 to the Regulations, and at a laboratory authorised by Defra, each day that product is consigned from the premises. There are separate versions of these Regulations in England, Scotland, Wales and Northern Ireland.

In all cases the following should be advised of isolations of *Salmonella*:

- Defra⁶
- the owner of the goods

10. Records

Suitable records should be maintained, and kept for a minimum period of two years, and may be required by enforcement officers and should be made available on request. The records should show:

- Details of movements of feeds into and out of the storage facility.
- Details of all vehicle movements.
- Details of samples taken and dates of sampling and testing.
- Details of all *Salmonella* test results including serotypes where appropriate.
- Details of actions taken following any *Salmonella* isolation.

11. Personnel

11.1

The aim should be to ensure that there are sufficient personnel with the ability, training and expertise necessary to make sure that the provisions of the Code are applied. All personnel who may be involved in storage and transport of feeds should be given clear guidance and instruction on their duties. Training should cover not only specific tasks but good hygiene practice generally and the importance of personal hygiene.

11.2

All sampling, cleaning, pest control, etc programmes should be the clear responsibility of specific named member(s) of staff or contractor(s).

11.3

All personnel should wear overalls or other appropriate garments. These should be regularly and frequently cleaned. All personnel entering the facility from a livestock enterprise should sanitise their hands and put on clean overalls and footwear when entering.

Eating and drinking should only be permitted within designated areas of the facility. Cloakroom and toilet facilities, where provided, should be kept clean.

⁶ The Zoonoses Order 1989 requires laboratories to report all isolations of *Salmonella* from animal/poultry feedstuffs and ingredients to Defra.

11.4

No person known to be suffering from a communicable enteric disease should be employed in the storage and transport of feeds if they are likely to come into direct contact with feeds or feed material.

12. Legislation

The Feed Hygiene Regulation (EC 183/2005) requires feed business operators to comply with standards concerning facilities and equipment, personnel, storage, transport and record-keeping. Feed businesses (except most farms) also have to apply the principles of HACCP. A number of the requirements of the Regulation are reflected in the guidance set out in this voluntary code for the control of *Salmonella*. However, feed business operators must observe the entirety of the Regulation as it applies to their feed business activities. A copy of EC Regulation 183/2005 can be found at:

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32005R0183:EN:HTML>

The Feed (Hygiene and Enforcement) Regulations 2005 provide for national enforcement (offences and penalties) and other administrative provisions in relation to EC Regulation 183/2005. There are separate and parallel Regulations for England, Scotland, Wales and Northern Ireland.

Further copies can be obtained from Defra Publications, Admail 6000, London SW1A 2XX (Tel: 0845 9556000)

© Crown copyright 1989 Revised July 2008 PB 2202

Section 3

Code of Practice for the Control of *Salmonella*

During the production of feed materials and feed additives

This non-statutory Code of Practice is issued by the Department for Environment Food and Rural Affairs, the Scottish Executive Environment and Rural Affairs Department, the Department of Agriculture and Rural Development (Northern Ireland) and the Welsh Assembly Government. It has been drawn up in consultation with the Agricultural Industries Confederation (AIC), the National Farmers' Union, the Farmers' Union of Wales, the Seed Crushers' and Oil Processors' Association and the Grain and Free Trade Association, Food & Drink Federation, National Farmers' Union Scotland, British Egg Industry Council, British Poultry Council, National Pig Association, Assured Combinable Crops, Genesis QA, Quality Meat Scotland.

Contents	Page
Introduction	32
1. Purpose of the Code	32
2. Definitions	32
3. Production	33
4. Premises	34
5. Equipment	36
6. Cleaning	37
7. Bacteriological Monitoring	37
8. Action to be taken following isolation of <i>Salmonella</i>	39
9. Records	39
10. Transport	39
11. Personnel	40
12. Legislation	40

Introduction

Salmonella organisms may occur are widespread in the environment and each link in the food chain, from producers to consumers, has a part to play in reducing the risk of human infection caused by *Salmonella*. Animal feedingstuffs are acknowledged to be one possible route by which *Salmonella* can enter the food chain.

This detailed Code of Practice provides non-statutory guidelines applicable to all feed business operators for establishing good production practices and safeguarding the microbiological quality of feed materials and additives used directly as, or intended for incorporation into, animal feedingstuffs.

The legal basis for the control of *Salmonella* is laid down in:

- Feed Hygiene Regulation EC/1831/2003
- Zoonosis Directive 2003/99/EC
- Control of *Salmonella* Regulation EC/2160/2003
- National statutory instrument implementing the above, as amended

1. Purpose of the Code

To ensure that feed materials and additives supplied for incorporation into, or direct use as, animal feedingstuffs are of a satisfactory bacteriological quality and to minimise the risk of *Salmonella* contamination.

2. Definitions

Additives (Regulation (EC) No 1831/2003)

Are substances, micro organisms or preparations, other than feed materials and premixtures, which are intentionally added to feed or water in order to perform, in particular, one or more of the following functions:

- a) Favourably affect the characteristics of feed
- b) Favourably affect the characteristics of animal products
- c) Favourably affect the colour of ornamental fish and birds
- d) Satisfy the nutritional needs of animals
- e) Favourably affect the environmental consequences of animal production
- f) Favourably affect animal production, performance or welfare, particularly by affecting the gastro-intestinal flora or digestibility of feedingstuffs,
- g) Have a coccidiostatic or histomonostatic effect

Feed materials

These are various products of vegetable or animal origin, in their natural state, fresh or preserved, and products derived from the industrial processing thereof, and organic or inorganic substances, whether or not containing additives, which are intended for use in oral animal feeding either directly as such or after processing, in the preparation of compound feedingstuffs or as carriers of premixtures.

Production

These are all operations including receipt of materials, production, packaging, repackaging, labelling, re-labelling, control and release. Storage and distribution should be according to separate Code of Practice for Storage and Transport of feed compounds, materials and additives.

3. Production

3.1 Good production practice

- a) Where appropriate all production processes should be clearly defined in writing and be capable of achieving the desired results. Procedures should be subject to regular and critical review to ensure that they continue to be effective.
- b) All necessary facilities should be provided, including:
 - i) appropriately trained personnel;
 - ii) individual written procedures, particularly those concerned with the minimisation of contamination;
 - iii) suitable storage and transport as defined in the separate Code of Practice for Storage and Transport of feed compounds, materials and additives.
- c) Adequate records should be maintained to assist the investigation of any positive *Salmonella*.

3.2 Hazard Analysis Critical Control Point (HACCP) systems

- a) There should be a comprehensive system designed, documented, recorded, implemented and controlled, so as to provide assurance that the feed material or additive will be consistently of a satisfactory bacteriological quality. The techniques of Hazard Analysis Critical Control Points (HACCP) must be applied as required by the Feed Hygiene Regulation (EC 183/2005). The purposes of the bacteriological monitoring provided for in **Section 7** are to provide an indication that bacteriological quality criteria are being met. Corrective actions are defined in the event that these criteria are not met.
- b) The principles of HACCP are defined in Codex Alimentarius Commission Code of Practice – General Principles of Food Hygiene. CAC/RCP 1 1969, Rev. 4 – 2003 (www.codexalimentarius.net).

4. Premises

Principle

Buildings should be located, designed, constructed, adapted and maintained to suit the operations carried out therein.

4.1 Pest control

Feed materials and additives should be produced and stored in facilities which protect against the entrance and harbouring of rodents, birds, insects and domestic, wild and feral animals and safe control measures should be regularly applied to exclude them.

- a) There must be an effective pest control programme. This must include:
- A plan of the site including locations of all bait stations
 - Details of frequency of checks, with records of findings and actions
 - Details of any baits/ chemicals used including Product Safety Data Sheets.
- b) The business should employ a suitably qualified person on site, e.g. holding a British Pest Control Association or equivalent qualification, have a vermin control contract with a BPCA registered company or follow HGCA guidance as appropriate.
- c) The control measures must ensure that poison baits cannot contaminate the feed. This may include using non-grain baits and securing bait points to avoid accidental contamination. Where practical, baits should be outside the actual production and storage areas unless there is a current pest problem in these areas. Where shooting is undertaken, non-toxic ammunition must be used.
- d) Waste and scrap materials, old pallets, overgrowth of vegetation or other materials which can encourage and harbour rodents must be removed from the proximity of the building. In particular, feed spills should be promptly removed. Proactive prevention is more effective than corrective action.

4.2 Production on livestock units

Where the production facility is located on the same premises as a livestock enterprise the production and storage area, including loading and unloading areas must be secure and clearly separate from the livestock enterprise and must not share a common enclosed airspace with the livestock.

Vehicle access must be regularly cleaned or otherwise kept free as far as practicable from any material which has come into contact with farm animals and from livestock faeces, litter and effluent. A separate access to the production facility may be necessary.

Livestock buildings must not drain onto the production facility or onto its access.

Buildings previously used to house animals or store their waste must first have been thoroughly cleaned to remove all organic material, disinfected and dried. Trailers, loaders etc. which have been used for other purposes should be similarly treated.

Special attention should be paid to control of pests and restriction of the access of pets, feral animals or poultry into feed production areas.

4.3 Building construction and layout

- a) The buildings should be soundly constructed of durable materials and fully enclosed or otherwise proofed against pests/ vermin and weather.
- b) The construction and surface finish of floors should be appropriate for the process carried out. They should be maintained in a clean and good state of repair. Floors and walls which may come into contact with feed or feed materials should have surfaces which are readily cleanable.
- c) Walls and ceilings should be clean and maintained in a good state of repair.
- d) Doors should be soundly constructed, close fitting and, where at all possible kept closed other than for personnel entry or for the inward or outward movement of feed materials. If it is necessary for ventilation purposes to open doors then suitable precautions should be taken to ensure this does not increase the risk of vermin and wild birds gaining entry.
- e) There should be sufficient clean hard standing at entrances and exits to minimise the tracking in of mud, effluent and other wet material by vehicles or personnel.
- f) The site should be well drained. Drains should be of adequate size and should be laid in accordance with the requirements of the local authority or other authorities having jurisdiction. They should have adequate trapped gullies and be properly ventilated.
- g) Plant layout should avoid creating un-cleanable recesses. In order to avoid dust containing *Salmonella* from contaminating the finished product, the intake to the processing area and any dust extraction should be physically separated from areas used to store and despatch the finished feed.
- h) The buildings should be effectively lit and ventilated, with air control facilities appropriate to both the operations undertaken within them and to the external environment. Steps should be taken to ensure that air used

to cool extrusions is suitable for that purpose and is not a potential source of contamination.

4.4 Plant operations

- a) The factory site, processing areas, laboratories and stores should be maintained in a clean and tidy condition and be free from accumulated waste.
- b) Waste material should be collected in suitable covered receptacles for removal to collection points away from the production areas. It should be disposed of at frequent intervals.
- c) Whenever possible, operation areas should not be used as a general right of way for personnel or materials passing through to other parts of the premises.
- d) The operations carried out in any particular area of the premises should be such as to minimise the risk of contamination of one product or raw material by another.

4.5 Storage areas

- a) A programme should be drawn up to ensure that all storage facilities are completely emptied and cleaned regularly and according to the type and condition of feed stored. Where appropriate storage areas should enable goods to be stored to allow their maintenance in a clean, dry and orderly condition. Keeping feed materials and additives dry is important since *Salmonella* needs moisture to multiply.
- b) Goods which have been rejected, recalled or returned should be placed in separate and adequately segregated storage to preclude contamination of other materials and products.
- c) Any store which has been used to contain feed materials contaminated with *Salmonella* should be decontaminated before use for other products.
- d) Storage bays/ bins/ silos should be organised to permit suitable and effective separation and identification of the various feed materials.

5. Equipment

Any equipment used to process, load, unload or otherwise handle feed materials should be suitable for the purpose for which it is being used and should be maintained in a clean condition.

Any equipment used to handle materials which could be a source of contamination, or feedingstuffs which are known to be contaminated, should be thoroughly cleaned, sanitised and if necessary dried before being used to handle other feed materials.

6. Cleaning

The accumulation of dust and feed remains must be minimised since they form a breeding ground for bacteria, and can also attract pests.

- a) There must be a planned cleaning programme, including methods, frequency and times of the cleaning and identifying who should carry out the cleaning.
- b) The chemicals used for cleaning feed contact surfaces must be suitable for this purpose, and used in accordance with the manufacturer's instructions.
- c) The residues of cleaning chemicals on feed contact surfaces must be minimised, and must not pose a threat to feed safety.
- d) Machinery which comes into contact with dry feed must be dried after wet cleaning or must be dry when they are to be used again. Because bacteria need moisture to grow, wet cleaning is often undesirable and should only be used where shown to be necessary as part of the HACCP plan and should always include disinfection with effective disinfectants at suitable concentration.
- e) Cleaning activities must be recorded.

7. Bacteriological Monitoring

7.1

All feed materials or additives for supply or sale and where appropriate raw materials for the process, production plant and equipment and the production environment must be subject to monitoring for the presence of *Salmonella*. Frequency of sampling and testing should be based on a risk assessment taking into account:

- the intended use of the feed material or additive
- bacteriological risks inherent in the process
- nature of raw materials and their sources
- past results

It is recommended that dust samples from key areas of the mill should be tested on a regular basis as well as testing feed materials and finished feed. Such samples could include dust emanating from intake pit augers, ingredient sieves, ingredient storage bins, pellet or meal coolers, pellet shakers finished product outloading gantry and main dust aspiration system. Any regular findings of *Salmonella* from these areas should be further investigated, particularly if the same serovar is repeatedly found in cooler areas, pellet shakers or dust aspiration.

The aim of the monitoring is to:

- a) check on the bacteriological quality of the feed and production environment; and,
- b) to take any necessary corrective action.

The information gained by this monitoring should be used to help select sources of raw materials for the process which may consistently provide the desired quality in the feed materials or additives produced or to monitor the effectiveness of microbiological hygiene in the production facility.

7.2 Sampling frequency

Samples should be taken according to a schedule based on risk assessment. The schedule should be planned and reviewed on a regular basis, in the light of results obtained. Sampling of incoming materials, finished products and the production environment should be considered in the sampling schedule.

7.3 Sampling

- a) Samples must only be taken by trained operatives.
- b) Sampling equipment (including the sample bag) must be clean.
- c) No contact must be made between the sample and the skin.
- d) The use of inverted plastic sampling bags is recommended.
- e) Samples (including composites) must be fully identifiable to allow full traceability in the case of isolation of *Salmonella*. Information on the type of material, country of origin and species for which feed is intended (if the sample is from a finished feed) should be recorded on the submission form supplied to the testing laboratory.
- f) Samples should be stored and transported in cool, dry conditions.

Samples where appropriate must be collected, handled and tested in accordance with approved methods laid down in **The Animal By-Products Regulations 2005** (SI No 2005/2347)⁷ at a Defra listed laboratory as approved under those Regulations or **ISO 17025**. *Salmonella* isolates must be serotyped by approved serotyping reference methods in an accredited laboratory and reported to Defra and if appropriate, the relevant devolved administration. Ideally the isolates should be sent directly to Veterinary Laboratories Agency who will carry out full serotyping free-of-charge.

⁷ The Animal By-Products Regulations 2005 requires any person carrying on a business involving the processing of animal protein to register their business with Defra and take samples of processed material for testing for the presence of *Salmonella*, using the approved methods set out in Part II of Schedule 3 to the Regulations, and at a laboratory authorised by Defra, each day that product is consigned from the premises. There are separate versions of these Regulations in England, Scotland, Wales and Northern Ireland.

8. Action to be taken following isolation of *Salmonella*

The action to be taken following the isolation of *Salmonella* will depend on the circumstances of the isolation. The following should be considered by the feed compounder:

Incoming materials:

- Clean and flush intake, routes and storage
- Vehicle cleaning (whether own vehicles or third party)
- Consider additional cleaning of plant and equipment
- Review test frequency and finished product test results

Finished products:

- Carry out traceability to identify the source of contamination
- Additional cleaning of storage and vehicles (where appropriate)
- Consider additional cleaning of plant and equipment
- Review finished product and environment test frequency and results

Environment:

- Additional cleaning of plant and equipment
- Environmental screening follow up
- Review environmental test frequency

In all cases the following should be advised of isolations of *Salmonella*:

- Defra⁸
- if required by the contract, the purchaser

9. Records

Suitable records should be maintained, and kept for a minimum period of two years, and may be required by enforcement officers and should be made available on request. The records should show:

- Details of movements of feed materials or additives and where appropriate raw materials for the process into and out of the production facility.
- Details of samples taken and dates of sampling and testing.
- Details of all *Salmonella* test results including serotypes where appropriate.
- Details of actions taken following any *Salmonella* isolation.

10. Transport

See separate Code of Practice for Storage and Transport of feed compounds, materials and additives.

⁸ The Zoonoses Order 1989 requires laboratories to report all isolations of *Salmonella* from animal/poultry feedstuffs and ingredients to Defra.

11. Personnel

11.1

The aim should be to ensure that there are sufficient personnel with the ability, training and expertise necessary to make sure that the provisions of the Code are applied. All personnel who may be involved in handling feed materials or additives should be given clear guidance and instruction on their duties. Training should cover not only specific tasks but good hygiene practice generally and the importance of personal hygiene.

11.2

All sampling, cleaning, pest control, etc programmes should be the clear responsibility of specific named member(s) of staff or contractor(s).

11.3

All personnel should wear overalls or other appropriate garments. These should be regularly and frequently cleaned. All personnel entering the facility from a livestock enterprise should sanitise their hands and put on clean overalls when entering.

Eating and drinking should only be permitted within designated areas of the facility. Cloakroom and toilet facilities, where provided, should be kept clean.

11.4

No person known to be suffering from a communicable enteric disease should be employed in the manufacture of compound feedingstuffs if they are likely to come into direct contact with feeds or feed material.

12. Legislation

The Feed Hygiene Regulation (EC 183/2005) requires feed business operators to comply with standards concerning facilities and equipment, personnel, storage, transport and record-keeping. Feed businesses (except most farms) also have to apply the principles of HACCP. A number of the requirements of the Regulation are reflected in the guidance set out in this voluntary code for the control of *Salmonella*. However, feed business operators must observe the entirety of the Regulation as it applies to their feed business activities. A copy of EC Regulation 183/2005 can be found at :

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32005R0183:EN:HTML>

The Feed (Hygiene and Enforcement) Regulations 2005 provide for national enforcement (offences and penalties) and other administrative provisions in

relation to EC Regulation 183/2005. There are separate and parallel Regulations for England, Scotland, Wales and Northern Ireland.

Further copies can be obtained from Defra Publications, Admail 6000, London SW1A 2XX (Tel: 0845 9556000)

© Crown copyright 1989 Revised July 2008 PB 2202