CODE OF PRACTICE FOR THE CONTROL OF SALMONELLA

In the Production of Final Feed for Livestock in Premises
Producing over 10,000 Tonnes per Annum
This non-statutory Code of Practice is issued by the Department for the Environment, Food and Rural Affairs, Scottish Executive Environment and Rural Affairs Department and the National Assembly for Wales. It has been drawn up in consultation with the United Kingdom Agricultural Supply and Trade Association, the National Farmers' Union, the Farmers' Union of Wales, the Seed Crushers' and Oil Processors' Association and the Grain and Feed Trade Association.
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1. Introduction

Salmonella organisms 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. The animal feedingstuffs industry has already made strenuous efforts, through voluntary and statutory measures, to reduce the contamination rates of animal feedingstuffs and their ingredients and substantial progress has been made since the introduction in 1989 of the Government’s package of measures to control salmonella. Considerable information is now available on the occurrence of salmonella in animal feedingstuffs.

This detailed Code of Practice provides non-statutory guidelines for establishing good production practices and safeguarding the microbiological quality of finished feed for all livestock.

2. Guide to the usage and handling of raw materials by final feed manufacturers

2.1 Principle

There should be a comprehensive system, designed, documented, implemented and controlled so as to provide assurance that the raw materials will be consistently of a satisfactory bacteriological quality. The purpose of the microbiological monitoring provided for in paragraph 2.3 is to:

a) enable purchasers to satisfy themselves as to the microbiological quality of raw materials; and,

b) if necessary take proactive action, e.g. select sources of raw material which most consistently provide the desired quality.

2.2 Purchase of raw materials

a) Processed animal protein should be obtained from manufacturers and suppliers who are registered under the Animal By-Products Regulations 2003 (SI 2003/1482)\(^1\). Imported animal protein should only be obtained when the import has been licensed under the Importation of Processed Animal Protein Order 1981 as amended (SI 1981/677, amended by SI 1982/459)\(^2\).

b) Raw materials should be obtained from suppliers who follow the Defra Code of Practice for the control of salmonella during the storage, handling and transport of raw materials intended for incorporation into, or direct use as, animal feedingstuffs (PB2202); the Defra Code of Practice for the control of salmonella in the animal by-

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\(^1\) The Animal By-Products Regulation 2003 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 2 of Schedule 2 to the Regulations and at a laboratory authorised by Defra, each day that product is consigned from the premises.

\(^2\) The purpose of the Importation of Processed Animal Protein Order 1981 is to prevent the infection of livestock in Great Britain with salmonella organisms from infected imports of processed animal protein in animal feed. It prohibits all imports of processed animal protein or of any product containing processed animal protein into Great Britain except under the authority of a licence. One of the conditions of such licences is that sampling for salmonella organisms takes place. The level of sampling varies according to the type of product and the country of origin.
product rendering industry (PB2199) or the Defra Code of Practice for the control of salmonella for the UK fish meal industry (PB2203) as appropriate.

c) Raw materials should only be obtained from sources with a consistently satisfactory bacteriological record.

2.3 Monitoring for the presence of salmonella

The principles of microbiological monitoring are outlined in Section 8.

3. Manufacture of final 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 raw materials or finished product contamination;

iii) suitable storage and transport.

c) Adequate formulation and production records should be maintained to assist the investigation of any positive salmonella results obtained on finished products and kept for a period of one year.

3.2 Hazard Analysis Critical Control Point (HACCP) systems

a) There should be a comprehensive system designed, documented, implemented and controlled, so as to provide assurance that final feedingstuffs will be consistently of a satisfactory bacteriological quality. The techniques of Hazard Analysis Critical Control Points (HACCP) are likely to be particularly useful in this respect. The purposes of the microbiological monitoring provided for in Section 8 is to provide an indication that bacteriological quality criteria are being met. Specific actions are recommended in the event that these criteria are not met.

b) The principles of HACCP are as follows:

i) all areas and processes are assessed for risk;

ii) regular surveillance of certain typical processing conditions and plant hygiene points known as Critical Control Points (CCPs) are completed, with reference to non-compliance limits for each CCP. Each non-compliance is recorded and acted upon using a non-compliance system assigned to each CCP.

iii) records of all HACCP systems should be kept for observation by the authorities or customers.
c) Practical experience has shown that there are a number of points at which salmonella contamination is likely to arise. They are summarised in the Appendix to this Code. Most of these points could be designated as CCPs.

4. Personnel and training

4.1 Principles

The aim should be that there are sufficient personnel with the ability, training and experience necessary to ensure that the provisions of this Code are applied. Their duties and responsibilities should be explained to them clearly and recorded as written job descriptions or by other suitable means. Training should cover not only specific tasks but good manufacturing practice generally and the importance of personal hygiene.

4.2 General

a) Key personnel should be responsible both for production and for quality control. Wherever possible, they should be different people, neither of whom should be responsible to the other, but who both have a responsibility for achieving the requisite quality. The person responsible for quality control should be in a position to carry out their functions impartially.

b) Key personnel should have designated deputies, where possible, and be provided with adequate supporting staff.

c) The distribution of responsibilities between key personnel should be clearly defined in writing.

4.3 Training

All personnel who are involved in the purchasing and handling of raw materials and in the production of final feedingstuffs and their transport should be trained in the principles of bacteriological hygiene and in the practice (and relevant theory) of the tasks assigned to them, including sampling procedures.

4.4 Hygiene

a) Cloakrooms and toilets where provided, should be kept clean. They should be conveniently available to, but separate from, production areas.

b) Eating, drinking and smoking should not be permitted within the production areas.

c) All operatives should wear garments appropriate to the process being carried out. The garments should be regularly and frequently cleaned.

d) Persons not regularly employed in a production area, whether employees of the feedingstuffs manufacturer or not, should wear clean protective garments where appropriate.

e) No person known to be suffering from a communicable enteric disease should be employed on production processes.

f) Sub-paragraphs a) to e) above are in addition to and in no way preclude compliance with existing health and safety codes.
5. Premises

5.1 Principle

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

5.2 General

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 receptacles for removal to collection points away from the production areas. It should be disposed of at frequent intervals.

c) 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.

d) The buildings should be constructed to protect as far as possible against entrance and harbouring of rodents, insects, birds and domestic animals, and control measures should be regularly applied to exclude these pests. The control treatment required should be carried out by trained personnel and should not contaminate goods in the building.

e) 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.

f) 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.

g) 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.

h) The construction and surface finish of floors should relate to the process carried out. They should be maintained in a clean and good state of repair.

i) Walls and ceilings should be clean and maintained in a good state of repair.

j) Plant layout should avoid creating uncleanable recesses.

5.3 Storage areas

a) All storage areas should be adequate and organised to permit suitable and effective separation and identification of the various raw materials, packing materials and finished products.

b) A programme should be drawn up to ensure that all storage facilities are completely emptied and cleaned regularly. Storage areas should enable goods to be stored to allow their maintenance in a clean, dry and orderly condition. Keeping raw materials and finished feedingstuffs dry is important since salmonella needs moisture to multiply.
c) 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.

d) Storage areas should be constructed to protect as far as possible against entrance and harbouring of rodents, insects, birds and domestic animals, and control measures should be regularly applied to exclude these pests. The control treatment required should be carried out by trained personnel and should not contaminate goods in the building.

e) Pallets should not be stacked against walls.

6. Equipment

Ideally, separate equipment should be used for raw materials and final feedingstuffs but it is recognised that resources may not always allow for this. All equipment should be maintained in a clean condition. Any equipment used to handle raw materials which could be a source of contamination should be thoroughly cleaned and dried before being used to handle final feedingstuffs.

7. Transport

7.1 Vehicles

a) The final feed manufacturer, or his agent, should ensure that all vehicles, including those operated by third parties, are inspected at the time of loading and found to be clean and dry before being used for the transport of final feed.

b) All vehicles used for the transport of final feed should be subjected to a regular cleaning and sanitising programme to ensure they are maintained in a clean state with no build up of waste material. If they are used for the carriage of other goods or materials, they should be thoroughly cleaned, sanitised and dried before being used to transport final feed.

c) Final feed should be protected from contamination and kept dry during transport. Enclosed vehicles or containers should be used whenever possible for loose bulk, but where this is impracticable, loads should be covered. Any covers 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.

7.2 Personnel

All personnel who may be involved in the transport of final feed should be given clear guidance and instructions on their duties. Training should not only cover specific tasks but good hygiene practice generally and the importance of personal hygiene.

8. Microbiological Monitoring

8.1 Introduction

The purpose of microbiological monitoring is to provide an indication that bacteriological quality criteria are being met, both for raw ingredients and finished products. The monitoring programme is designed to allow manufacturers to make use of the results to control quality at all stages of the manufacturing process. The programme has two main components:
i) monitoring of incoming raw materials;

ii) monitoring of outgoing finished products.

In some circumstances, manufacturers may wish to supplement this with monitoring at critical control points in the manufacturing process, particularly when attempting to identify a source of contamination or when assessing hygiene at these points.

8.2 Resources

The following resources are necessary for effective monitoring:

a) adequate facilities and staff should be available for sampling;

b) sampling of feedingstuffs should be in accordance with written schedules;

c) manufacturers of feedingstuffs should have access to appropriate facilities for bacteriological examination;

d) results of the inspection and testing of feedingstuffs should be formally assessed by the person responsible for quality control and appropriate records maintained using in-house data or that available from third parties as appropriate;

e) sufficient reference samples of feedingstuffs should be retained to permit future examination if necessary.

8.3 Methods of analysis

a) Samples should be collected and tested without delay using one of the approved methods of analysis for salmonella set out in Part 2 of Schedule 2 of the Animal By-Products Regulations 2003;

b) Isolations of salmonella should be serotyped by approved serotype reference methods.

8.4 Records

The following records should be kept:

a) details of samples taken and date of sampling;

b) details of any isolation and serotype;

c) details of action taken.

8.5 Sampling procedures for raw materials

Three categories of risk (high, medium and low) should be established by each final feed manufacturer relating to the previous history of the source of supply of each raw material. The sampling and monitoring for each category of raw material on delivery to the mills should vary in accordance with the established risk factor, increasing for high risk and decreasing for low risk materials, and could take into account any pre-delivery sampling the material has been subject to.

8.6 Sampling procedure for finished products
Daily samples should be taken as near the point of despatch from the premises as possible for each of the following categories:

* pig and poultry meals;
* poultry extrusions;
* pig extrusions;
* ruminant feedingstuffs;
* concentrates.

Samples should be bulked by category into a weekly aggregate and tested. Where the quantities of production in any week in one category is less than 40 tonnes, samples from these could be bulked together up to a total maximum representing not more than 100 tonnes.

If the results of monitoring final feedingstuffs are consistently satisfactory over a period of at least three months, samples could be bulked by category into a fortnightly aggregate and tested. Testing of the aggregated sample should be phased so that weekly testing is undertaken.

8.7 Action which should be taken if a sample is found positive

a) Raw ingredients

i) notify Defra 3, the supplier, storekeeper and haulier of the isolation;

ii) increase the rate of monitoring of supplies from the same source to investigate the relevance of the isolation;

iii) if contaminated material is present in the mill, it should be removed from the mill for decontamination;

iv) if contaminated material is present on the premises and cannot be removed, this should only be incorporated into feed which will be subjected to appropriate processing such as pelleting under defined conditions of temperature and conditioning time sufficient to kill salmonella, or treatment with a product to decontaminate the feed;

v) in the longer term, the purpose of microbiological monitoring is to enable purchasers to satisfy themselves as to the microbiological quality of incoming raw materials. The information gained by this monitoring should be used to help select sources of raw materials which most consistently provide the desired quality.

b) Finished products

The purpose of microbiological monitoring is to provide an indication that bacteriological quality criteria are being met. Isolation of salmonella suggests that these criteria are not being met, and the following action is recommended:

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3 The Zoonoses Order 1989 requires laboratories to report all isolations of salmonella from animal/poultry feedstuffs and ingredients.
i) ensure that Defra is notified of the isolation;

ii) mill and raw material management to be informed immediately;

iii) increase intensity of sampling and testing of production;

iv) apply an effective treatment regime for product produced through the plant;

v) investigate raw material records appropriate to the finished feed sample. Comparison of salmonella records can provide useful information on the most likely source of contamination. If salmonellas are only occasionally found in finished feed and, where found, are of variable serotypes that are the same as those found in raw ingredients, then carry over of contamination from those ingredients is likely to be the cause of contamination of finished product. However, where a single serotype of salmonella is found on a more frequent basis, there is likely to be a persistent source of contamination somewhere within the mill;

vi) investigate the particular sections of the plant through which the product was manufactured paying particular attention to those Critical Control Points at which salmonella contamination is most likely to occur;

vii) if further isolations occur, instigate a thorough clean-down regime for the plant.

The Appendix to this code summarises those points which, in the light of practical experience, have most frequently been a source of contamination.

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4 See footnote 3.
Appendix

Salmonella contamination hazards at compound feed mills

a) Practical experience in the feedingstuffs industry has shown that there are a number of points within a feedmill at which salmonella contamination is most likely to arise.

b) These are:

* the ingredient intake pit;
* ingredient storage bins;
* kettle conditioners;
* coolers;
* tote bins used for warehouse storage of finished products;
* outloading gantries.