

Guidance on Mechanically Separated Meat (MSM)

The definition of MSM and implications for Food Business Operators

Published: TBC

Revision history

Revision number	Date	Purpose of revision	Revised by
1	[publication month and year]	Guidance implemented	

Summary

Purpose

To provide guidance on how the definition of Mechanically Separated Meat (MSM) in Annex I, point 1.14 of assimilated Regulation (EC) No 853/2004 and Regulation (EC) No 853/2004 in Northern Ireland should be applied.

Legal status

Regulatory Compliance Guidance, this document provides guidance on how to comply with regulatory requirements.

Who is this publication for?

This guidance is primarily for:

- Food Business Operators (FBOs) - MSM and/or meat preparations manufacturers/processors/handlers; businesses that incorporate MSM and/or meat preparations in other products; businesses that place such products on the UK market and exporters.
- It may also be used by Local Authorities (LAs); FSA Operational staff; and Department of Agriculture, Environment and Rural Affairs (DAERA) staff in NI to support official controls and ensure consistency of the regulatory approach.

Which UK countries does this guidance apply to?

- England
- Wales
- Northern Ireland

Review date

We will review this guidance by [TBC].

Key words

- Mechanically separated meat (MSM)
- Meat hygiene
- Food law

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Introduction

1. [Assimilated Regulation \(EC\) No 853/2004](#) in GB / [Regulation \(EC\) No 853/2004](#) in Northern Ireland (NI) (together ‘the Regulations’) lay down specific hygiene rules for Food Business Operators (FBOs) in relation to food of animal origin. The specific hygiene requirements that must be applied to the preparation and handling of products of animal origin depend on the nature of the product as defined under the Regulations. Establishments manufacturing and/or handling products subject to requirements under Annex III to the Regulations must be approved for the manufacture and/or handling of products that they wish to place on the market unless a relevant exemption applies.
2. A product must be correctly classified to ensure that its preparation and handling meet the requirements of food law for that product. Product classifications are set out in the definitions provided in Annex I to the Regulations.
3. The Courts have delivered judgments (together ‘the Judgments’) that clarify how the definition of MSM in Annex I to the Regulations should be interpreted and applied. There have been no changes to the Regulations as a result of the Judgments; no legislative requirements regarding MSM have been added, amended or removed.
4. This guidance provides advice and clarification on implications of the Judgments. It supersedes the 2012 Guidance on the Moratorium regarding the production and use of desinewed meat (‘DSM’) in the UK, which was officially withdrawn on 14 November 2022.
5. It remains prohibited to use bones or bone-in cuts of bovine, ovine and caprine animals for the production of MSM, under Annex V of [assimilated Regulation \(EC\) No 999/2001](#) in GB / [Regulation \(EC\) No 999/2001](#) in NI, laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies (TSEs).

Intended audience

6. This guidance is intended for:

- FBOs currently using, or intending to use, mechanical meat separation equipment in their production processes (for example, Baader, SEPAmatic, Marel and other food processing machines).
 - FBOs using, or intending to use, MSM as an ingredient.
 - FBOs producing or using, or intending to produce or use, an ingredient for which clarity is required as to its classification i.e., whether it is MSM.
 - FBOs that place MSM products and/or meat preparations products on the England, Wales and NI markets and exporters.
7. While this guidance is primarily intended to support FBOs to achieve compliance with the regulatory requirements, it may be used by Local Authorities, FSA Operational and DAERA staff to support official controls and provide consistency of the regulatory approach.

Purpose of the guidance

8. The Court Judgments clarified how the definition of MSM in Annex I to the Regulations is to be interpreted and applied. This guidance supports FBOs in determining whether a product is MSM to ensure their compliance in line with regulatory requirements.
9. Further general information on MSM and assistance in understanding implications for FBOs can be found in Annex A: MSM Q&A.

Legal status of the guidance

10. Assimilated EU Law is identified in this guidance using the following format: assimilated Regulation (EC) No xxx/xxxx. In NI, EU law continues to apply for most food law and feed hygiene and safety law and is identified in this guidance using the following format: Regulation (EC) No xxx/xxxx.
11. This guidance document has been produced to provide:
- Guidance on the legal requirements of the Regulations in so far as they concern the production, handling and labelling of MSM.

- Guidance on the TSE measures concerning MSM under Article 9 and Annex V (paragraph 5) of assimilated Regulation (EC) No 999/2001 in GB and Regulation (EC) No 999/2001 in NI.
 - Guidance on the microbiological criteria for foodstuffs in assimilated Regulation (EC) No 2073/2005 in GB and Regulation (EC) No 2073/2005 in NI, in so far as they concern the production of MSM.
12. It is the responsibility of the FBO to comply with food law. This guidance document cannot cover every situation and you may need to consider the relevant legislation to understand how it applies in your circumstances. FBOs may wish to seek advice from their competent authority; an FSA-appointed Official Veterinarian (OV), for FSA-approved establishments; or [local food safety team](#), for Local Authority-approved or -registered establishments.

Review

13. We undertake regular reviews to ensure guidance remains relevant. The next scheduled review date for this guidance is [TBC].

Contact us

14. We welcome feedback on this guidance, including reports of broken links or out of date content, and will consider all feedback in the next review. Please provide any feedback to meathygiene@food.gov.uk.

Mechanically Separated Meat

Definition

15. The definition of MSM is given at Point 1.14 of Annex I to the Regulations:
“Mechanically separated meat’ or ‘MSM’ means the product obtained by removing meat from flesh-bearing bones after boning or from poultry carcasses, using mechanical means resulting in the loss or modification of the muscle fibre structure.”

16. The Courts have considered and interpreted the definition of MSM. That interpretation must be applied in determining whether MSM has been/is being/will be produced.
17. Section V of Annex III to the Regulations sets out specific requirements that must be met regarding the production of minced meat, meat preparations and MSM. There are requirements regarding production establishments, raw materials, hygiene (during and after production), and labelling.
18. For a product that is determined to be MSM in accordance with the Courts' interpretation, requirements in Section V of Annex III must be met for it to be placed on the market lawfully.
19. FBOs should consider any additional legislative requirements (e.g., labelling requirements) as necessary.

Court rulings on MSM ('the Judgments')

20. The Courts have delivered the following judgments relevant to the interpretation of the definition of MSM set out in Annex I, Point 1.14 of the Regulations:
 - Court of Justice of the European Union [Case C-453/13](#) of 16 October 2014
 - High Court [Case No: CO/6923/2012](#) of 23 March 2016
 - Court of Appeal [Case No: C1/2016/2112](#) of 25 May 2017
 - Supreme Court [Case ID UKSC 2017/0110](#) of 3 April 2019
 - High Court Judgment [Case No: CO/4360/2021](#) of 5 July 2022
21. Only the Courts can give authoritative statements of the requirements of food law. As the Judgments considered the production of MSM under the Regulations, their relevance is not limited to a specific process used or to any specific type or brand of equipment which has a mechanical separation function.

Interpretation of the definition of MSM by the Courts

22. The Courts have interpreted that the definition of MSM is based on three cumulative criteria, which must be read in conjunction with one another, when determining whether a product is MSM. A product that satisfies all three criteria is classified as MSM:
- i. The use of bones from which the intact muscles have already been detached, or of poultry carcasses, to which meat remains attached;
 - ii. The use of methods of mechanical separation to recover that meat; and
 - iii. The loss or modification of the muscle fibre structure of the meat thus recovered by reason of the use of those processes.

The use of bones from which the intact muscles have already been detached, or of poultry carcasses, to which meat remains attached

23. The definition of MSM refers to the removal of the meat left on the bones of those animals after the initial phase of butchering has taken place and from which the intact muscles have already been detached. The initial phase of butchering means anything after the first cut or the first act of removal or separation of bones or portions of meat from carcasses.
24. For meat other than poultry, any bone removed from the carcasses or cuts of meat with bones that go through the mechanical separation process, after the initial phase of butchering/cutting, will result in the production of MSM, if it also results in the loss or modification of the muscle fibre structure.
25. Regarding poultry, the first element of the definition of MSM states “poultry carcasses”. This means poultry carcasses to which meat remains attached. The removal of meat from the whole body of the bird and the use of any bones, or portions of meat with bones, as raw materials will result in the production of MSM, if also resulting in the loss or modification of the muscle fibre structure.

26. There is no difference in the final product based on whether a whole poultry carcass, half a poultry carcass, or poultry bone-in cuts go through the relevant mechanical separation process.

The use of methods of mechanical separation to recover that meat

27. The methods of mechanical separation to recover meat from the raw materials referred to in the first criterion usually involve forcing the raw materials under pressure through a sieve or a similar device to separate the bone from the meat tissue.
28. The requirements set out in the Regulations differentiate between two MSM subtypes depending on production techniques used. Each subtype has specific legal requirements regarding how it must be produced and used, given in paragraphs 3 & 4, Chapter III, Section V, Annex III to the Regulations.

The loss or modification of the muscle fibre structure

29. The definition of MSM in the Regulations does not consider the extent of any loss or modification of muscle fibre structure; rather, it considers whether there is loss or modification at all.
30. Any loss or modification of the muscle fibre structure will result in MSM, irrespective of the degree, in so far as, by reason of the process used, that loss or modification is greater than that which is strictly confined to the cutting point.
31. The mechanical separation of residual meat from bones will produce separation, shearing or cutting, resulting in modification of the muscle fibre structure at other points in addition to the point from which the intact muscles have been removed.
32. The definition of MSM does not require microscopic analysis to determine the degree of loss or modification of the muscle fibre structure. In addition to taking account of source material and processes used, visual inspection should be used to determine whether loss or modification of the muscle fibre structure has occurred.

Contacts, Approvals and Further Information

Contacts

33. If further clarification is required on the guidance, please contact the FSA's Meat Hygiene Policy teams using the relevant email address.

England: meathygiene@food.gov.uk

Wales: Food.Policy.Wales@food.gov.uk

Northern Ireland: NIOperationalpolicy@food.gov.uk

34. If an enquiry is regarding how the Guidance applies to specific production processes, please seek advice from your competent authority, an FSA appointed Official Veterinarian for FSA approved establishments, or your [Local Authority food safety team](#) for Local Authority approved/registered establishments.

Approvals

35. Should you wish to produce MSM, you will require approval from the FSA or your Local Authority.
36. For further information on the approvals process, please refer to the FSA webpage: [How to apply for approval of a meat or food establishment](#).
37. If your establishment requires approval from the FSA to produce MSM, please apply via the [FSA approvals service](#). If your establishment requires approval from a Local Authority, please contact your [Local Authority food safety team](#).

Further Information

38. For more information, including general enquiries and implications for FBOs, see Annex A: MSM Q&A.

Annex A: MSM Q&A

General Queries

1. What is mechanically separated meat (MSM)?

MSM is obtained by removing meat from flesh-bearing bones after boning has occurred (for red meat species, typically pork as cattle-, sheep- and goat- derived MSM is prohibited); or from poultry carcasses. The product is MSM if it is obtained using mechanical means resulting in loss or modification of the muscle fibre structure.

MSM is safe for consumers, assuming it is produced in accordance with legislative requirements, and is used as an ingredient in a wide variety of final products. It cannot, however, count towards the percentage meat content indicated on the labelling of those products under assimilated Regulation (EU) No 1169/2011 in GB / Regulation (EU) No 1169/2011 in NI.

2. What is MSM used for?

There are two MSM subtypes depending on the techniques used during mechanical separation. The subtype produced determines its permitted uses. The subtypes are:

- MSM produced using techniques that do not alter the structure of the bones, and the calcium content of which is not significantly higher than that of minced meat (does not exceed 0,1 % (=100 mg/100 g or 1000 ppm)).
 - Production and uses are subject to hygiene requirements set out in Annex III to the Regulations, Section V, Chapter III, paragraph 3; and labelling requirements in Chapter IV.
 - This subtype can be used in meat preparations clearly intended to be cooked, and in meat products. Typical examples include products that are not ready-to-eat, such as burgers and chicken nuggets.
- MSM produced using techniques other than those mentioned in the point above.
 - Production and uses are subject to hygiene requirements set out in Annex III to the Regulations, Section V, Chapter III, paragraph 4; and labelling requirements in Chapter IV.

- This subtype can only be used in the manufacture of heat-treated, ready-to-eat products by approved establishments. Typical examples include cooked sausages such as frankfurters, and canned meat.

3. Are there alternative terms used for MSM?

'Baader meat' and '3mm meat' are among alternative terms used in industry to describe products of mechanical separation, often referring to the machinery brand used or the sieving aperture of the equipment. Such terms often do not relate to the type of product produced and they are not defined in law. Products produced per the three cumulative criteria that determine whether a product is MSM must only be classified as 'mechanically separated meat' or 'MSM' and labelled appropriately.

4. Are there any food safety concerns?

There are no food safety concerns for MSM produced in line with regulatory requirements and it is safe to use as an ingredient in foods. Where MSM is produced in line with hygiene requirements, microbiological risks are similar to those for meat preparations and minced meat. However, there are stricter requirements for MSM (e.g., permitted raw materials, uses, and hygiene controls) to ensure food safety due to the comminuted nature of the product. ¹

5. Is MSM derived from cattle, sheep or goat a risk to public health?

The use of bovine, ovine and caprine (cattle, sheep and goat) bones, or bone-in cuts, as raw material for MSM is prohibited and has been since 2001 due to public health concerns. Specifically, the potential risk of Transmissible Spongiform Encephalopathies (TSE) including Bovine Spongiform Encephalopathy (BSE). ²

6. Does the withdrawal of the previous guidance documents* relating to MSM and the publication of new guidance mean changes to the law on MSM?

¹ Assimilated Regulation (EC) No 853/2004 Annex III, Section V, Chapters II & III in GB and Regulation (EC) No 853/2004 Annex III, Section V, Chapters II & III in NI

² Assimilated Regulation (EC) No 999/2001 Annex V, Paragraphs 5 in GB and Regulation (EC) No 999/2001 Annex V, Paragraph 5 in NI

*The guidance to the moratorium on 'desinewed meat' was withdrawn (as was the moratorium itself) on 14 November 2022.

There have been no changes to the Regulations as a result of the Judgments; no legislative requirements regarding MSM have been added, amended or removed. The Courts have delivered judgments that clarify how the definition of MSM in Annex I to the Regulations is to be interpreted and applied.

Implications for FBOs

7. What must FBOs do?

FBOs must ensure that they are compliant with legislative requirements regarding MSM.

Given the clarification of the definition of MSM, there may be products that previously (i.e., before the withdrawal of the moratorium in November 2022) were not classified as MSM that now must be correctly classified as MSM. This affects the production of MSM and the use of MSM as an ingredient in other products.

The guidance is intended to assist FBOs to achieve regulatory compliance. Specific measures to be taken by FBOs (e.g., labelling changes or product reformulation) will differ on a case-by-case basis. If an FBO needs additional support, they should contact the FSA or their Local Authority for advice.

8. What are the requirements for producing MSM and placing it on the market?

Food hygiene requirements are set down in the Regulations regarding the production of MSM from pork and from poultry. Different requirements apply for each of the two subtypes of MSM (see question 2).

MSM does not contribute to the meat content of final products and must be labelled in accordance with legislative requirements (see question 14).

9. Will removal of sinews and/or tendons from boneless meat by mechanical means result in MSM?

This guidance highlights the three cumulative criteria that must be met for a product to be classified as MSM, as set out by the Courts.

The removal of sinews and/or tendons from boneless meat cuts does not meet the first criterion. As the raw material does not contain bone, the cumulative criteria are not met therefore, in this case, the end product is not MSM.

Some FBOs use mechanical means to separate meat from unwanted tissues (e.g., tendons, sinews, cartilage, grit etc), as part of a quality check. If the raw materials used are not bone-in portions and are visually bone-free, this does not result in the production of MSM. FBOs should have procedures in place detailing the purposes of their processes to clarify the intentions of activities.

10. How will poultry wishbone meat be classified?

The definition of MSM in the Regulations reads: “mechanically separated meat or MSM means the product obtained by removing meat from flesh-bearing bones after boning or from poultry carcasses, using mechanical means resulting in the loss or modification of the muscle fibre structure”.

Regarding the use of “the removal of meat from poultry carcasses” in the definition: mechanically recovering meat from whole carcasses, any bones, and portions with bones, may result in the production of MSM.

Regarding the use of the term “boning” in the definition: this refers to removal of the meat left on the bones of those animals after the initial phase of butchering has taken place. This means anything after the first cut or the first act of removal or separation of bones or portions of meat from the carcass.

Wishbone trims consist of the wishbone with some muscle attached after it is removed from the breast of poultry carcasses. Wishbone trims are obtained by the initial butchering or cutting of the carcass (first cut or removal or separation of bones or portions of meat from the carcass). If mechanical separation is then used to remove the meat from the wishbone, this results in MSM, if there is loss or modification of the muscle fibre structure.

11. What are the implications for bone-in portions with intact muscles attached?

Bone-in portions with intact muscles attached result in the production of MSM if they undergo a mechanical separation process and there is loss or modification of the fibre muscle structure.

Some bone-in portions used as raw materials for mechanical separation have some intact muscles attached (e.g., pork ribcage). Previously (i.e., under the moratorium) products resulting from such 'cuts' may not have been classified as MSM as it was considered that the first criterion (i.e., the use of bones from which the intact muscles have already been detached) was not met. That application of the first criterion is incorrect where the bone-in portion or 'cut' has been subjected to some prior type of deboning and removal of muscles even if that deboning did not involve the removal of the bulk of the meat that was originally attached to the bone.

12. Is there any difference between the products of mechanical separation depending on the amount of residual meat on the raw material used?

There are no legislative requirements that regard the quantity of meat on the raw material. Any bones or portions of meat with bones that go through mechanical separation result in MSM, if there is loss or modification of muscle fibre structure, irrespective of the proportions of meat and bone present.

13. How should loss or modification of muscle fibre structure be assessed?

Visual inspection should be used to determine whether the muscle fibre structure has been lost or modified. It is not necessary to assess muscle fibre structure by microscopy to determine whether a product is MSM.

14. When MSM is used as an ingredient, how should it be labelled?

MSM as defined in Annex I of the Regulations must be labelled in the ingredients list as 'Mechanically Separated Meat' with the name(s) of animal species from which it derives.

The Regulations state that packages intended for the final consumer containing meat preparations that contain MSM must bear a notice indicating that such products should be cooked before consumption.

Defra leads on labelling legislation in England; the FSA in Wales and NI; Food Standards Scotland (FSS) in Scotland.

Food labelling law in the UK is set out in a combination of assimilated law (GB), directly applicable EU law (NI), and domestic legislation. The Food Information to Consumers (FIC) assimilated Regulation (EU) No 1169/2011 in GB / Regulation (EU)

No 1169/2011 in NI is one of the principal pieces of legislation that specifies food labelling requirements.

FIC Article 7.1 requires that information may not be provided which is misleading as to the characteristics of food, particularly its nature, composition, method of manufacture or production. Article 17 requires that the name of the food shall be its legal name or, in the absence of such a name, its customary name or, if there is no customary name or it is not used, a descriptive name. Article 18 requires that ingredients listed on food shall be designated by their specific name.

Annex VII (to FIC) Part B makes clear that products classified as MSM may not be labelled as 'meat'. In declaring the meat content of food, MSM must not be considered meat content.

In terms of MSM labelling during production and before manufacturing into the final products, Article 18 of assimilated Regulation (EC) No 178/2002 in GB / Regulation (EC) No 178/2002 in NI states that traceability of products must be established at all stages of production, processing and distribution. Article 3 of assimilated Regulation (EC) No 931/2011 in GB / Regulation (EC) No 931/2011 in NI also provides traceability requirements about information to be made available to suppliers and competent authorities.

15. Will the Court Judgments or the implementation of this Guidance result in meat being disposed of, increasing food waste?

The Judgments do not prevent any products from entering the food chain. Assuming it is produced in line with the Regulations, MSM is safe to eat and to use as an ingredient. Some products that previously were not considered to be MSM (under the guidance to the moratorium) must now be classified, treated and used only as MSM, where the three criteria laid out in this guidance are met.

16. Can MSM be exported to the EU/NI?

If a food business is approved to produce MSM and is listed by the EU as authorised to export MSM to the EU, then the products can be exported to the EU and NI, if compliant with EU requirements. All exports to the EU/NI, including MSM, must meet EU requirements and must be accompanied by the appropriate export health certificate (EHC). GB has adopted an EHC for pork MSM. It can therefore be exported

to the EU and NI (with the EHC) from a GB establishment listed by the EU as authorised for export of pork MSM.

An EHC for the export of poultry MSM from GB to the EU and NI has not been established. Therefore, poultry MSM cannot currently be exported to the EU and NI. However, poultry MSM used in the manufacture of meat preparations or meat products in GB can be exported as part of those meat preparations or meat products. Pre-packed goods for retail containing MSM can be moved to NI via the NI Retail Movement Scheme under one general certificate (MSM in bulk for further processing will need to be exported to NI via an EHC).

To find EHCs and associated documentation for live animals and animal products, please use this link: [Find an export health Certificate](#).

Annex B: List of relevant legislation

- [Assimilated Regulation \(EC\) No 853/2004](#) in GB / [Regulation \(EC\) No 853/2004](#) in NI
- [Assimilated Regulation \(EU\) No 1169/2011](#) in GB / [Regulation \(EU\) No 1169/2011](#) in NI
- [Assimilated Regulation \(EC\) No 999/2001](#) in GB / [Regulation \(EC\) No 999/2001](#) in NI
- [Assimilated Regulation \(EC\) No 2073/2005](#) / [Regulation \(EC\) No 2073/2005](#) in NI

The FSA undertakes regular reviews to ensure guidance remains relevant. However, the FSA cannot guarantee that links provided are continuously up to date. FBOs are responsible for ensuring that they are compliant with food law and should take necessary measures to ensure that they have access to current versions of legislative requirements.



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