

# Chapter 17 Wrapping, Packaging and Transport Hygiene

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## 17. Introduction

Unprotected or poorly wrapped and / or packaged food may be vulnerable to microbiological contamination and cross-contamination. Use of the inappropriate wrapping materials may lead to chemical contamination. Unhygienic storage and assembly of wrapping and packaging can contaminate the materials and therefore the food.

During transport food may be exposed to microbiological and physical hazards from the environment or through cross-contamination from other food. Poor cleaning or maintenance of transport vehicles may also give rise to chemical hazards. Procedures are needed to prevent or minimise the risk of all such hazards causing illness to consumers. Wrapping and packaging can control microbial spoilage by, for example, packaging meat in protective atmospheres using varying levels of oxygen (O<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and nitrogen (N<sub>2</sub>).

Examples demonstrating the importance of wrapping, packaging and transport hygiene:

Problem	Effect	Possible outcome
Poor quality wrapping materials	Materials can tear	Food is exposed to contamination
Inappropriate wrapping materials	Materials may contain chemicals	Food is tainted by chemicals in the wrapping material
Poor storage conditions	Wrapping and / or packaging can deteriorate	Food is contaminated by dirt and pests
Unlined cardboard cartons	Cartons can absorb microbiological contamination and be a source of dust and paper fragments	A source of microbiological and physical contamination
Inadequate cleaning of reusable containers	Cross-contamination between product batches	Increased chance of contamination of food products by food poisoning bacteria (such as Salmonella)
Inadequate separation between exposed and packaged meat during transport	Cross-contamination of food	
Transport is poorly cleaned, maintained or unsuitable vehicles or containers are used to transport food	Microbiological, physical or chemical cross contamination of food	

### **17.1. Vacuum and modified atmosphere packed chilled foods guidance**

Although vacuum packing techniques are used to increase the shelf-life of chilled foods by removing air, certain bacteria such as *Clostridium estertheticum* and *Clostridium botulinum* are still able to grow. The guidance sets out processes, such as heat treatment, pH and salt levels, that should be used if food businesses are setting a shelf-life of more than ten days.

The technical guidance and factsheet to help assess and minimise the risk of *Clostridium botulinum* in vacuum and modified atmosphere packed chilled foods are available at:  
[www.food.gov.uk/foodindustry/guidancenotes/foodguid/vacpac](http://www.food.gov.uk/foodindustry/guidancenotes/foodguid/vacpac).

### **17.2. Transport of livestock and food guidance**

**Livestock transport** – see chapter on ‘Acceptance and slaughter of animals’.

**Transport of animal by-products** – see chapter 5 of the separate ‘Edible co-products industry guide’ available at:

[www.food.gov.uk/foodindustry/guidancenotes/meatregsguid/coproductbyproductguide](http://www.food.gov.uk/foodindustry/guidancenotes/meatregsguid/coproductbyproductguide)

See ‘B. Transport of food, including meat’.

### 17.3. Legal requirements for wrapping, packaging and transport hygiene

The following sections set out the wrapping, packaging and transport requirements of the regulations that apply to carcasses, offal, cut and processed meat.

#### A. Wrapping and packaging

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##### Legal requirement

##### 852/2004 Annex II Wrapping & Packaging: Chapter X point 2

**A1.** Wrapping materials are to be stored in such a manner that they are not exposed to a risk of contamination.

##### 852/2004 Annex II Foodstuffs: Chapter IX points 4 & 5

**A2.** Adequate procedures are to be in place to control pests.

**A3.** Food businesses manufacturing, handling and wrapping processed foodstuffs are to have suitable rooms; large enough for the separate storage of raw materials from processed material...

#### A1. to A3. Compliance regarding wrapping and packaging design and storage

- Store wrapping materials in such a way that they do not become contaminated.
- Put adequate pest control procedures in place.
- Make sure that if processed foodstuffs are being wrapped, there are large enough rooms for the separate storage of raw materials from processed material.

#### A1. to A3. Good practice

Consider the design and construction of premises or when buildings are rebuilt, altered or refurbished is adequate for the anticipated throughput:

- for storage of wrapping materials so that they are off the floor and free from dust and other contamination
- for storage of packaging materials so that they are off the floor
- for assembly of wrapping/packaging before use
- for wrapping and packaging of meat (including offal) and for its products
- for the separate storage of packaged and exposed meat and its products

See chapter 2 on 'Design and facilities'.

**Pest control** – wrapping and packaging materials can provide shelter and nesting material for pests, so make sure stores are kept pest free. See chapter 6 on 'Pest Control'.

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Storage facilities and practices - packaged and exposed meat can be stored in the same chiller providing that arrangements are in place to prevent hygiene being compromised. Vacuum-packed meat and meat in clean trays can be stored with exposed meat as long as it is not contaminated by carcass drip (there is spatial separation between exposed and vacuum-packed meat).

Ensure there is enough space to store raw meat separately from processed and/or packaged products. This can be done by keeping them in the same store at a different time or at the same time with either a permanent barrier between them that can be cleaned and disinfected or by using an appropriately placed polythene covering to prevent air-borne cross-contamination.

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#### Legal requirement

**852/2004 Annex II Wrapping & Packaging: Chapter X points 1, 3, 4**

**A4.** Material used for wrapping and packaging is not to be a source of contamination.

**A5.** Wrapping and packaging operations are to be carried out so as to avoid contamination of the products. Where appropriate, and in particular in the case of cans and glass jars, the integrity of the container's construction and its cleanliness is to be assured.

#### A4. and A5. Compliance regarding wrapping and packaging materials

Make sure that:

- material used for wrapping or packaging is not a source of contamination
- the integrity of the construction and cleanliness of containers is assured

#### A4. and A5. Good practice

Only use wrapping materials that are suitable for contact with food and that do not adversely affect the taste and smell of the product. Wrapping and packaging materials must protect the meat during storage, handling and transport. Polythene is the most common wrapping material although other materials may be suitable.

If materials meet the requirements of wrapping and are strong enough they may serve as both wrapping and packaging, for example:

- **Polyboxes** – cardboard cartons with a plastic inner coating
- **Vacuum packaging** – such as rigid or flexible containers from which the majority of air can be removed

- **Modified atmosphere packages (MAP)** – in which a combination of gases such as oxygen, carbon dioxide and nitrogen are introduced into the package at the time of closure

Food can be placed directly into these containers without pre-wrapping and without the need for outer packaging. However, it is common for vacuum or MAP packaged products to be transported in plastic re-usable trays.

**Receipt of inadequately wrapped/package meat** – if received, decide whether the meat is fit or unfit and take appropriate action, which may include:

- investigating the cause of the problem
- trimming of visible contamination
- disposal as a by-product
- return to the originating premises suitably protected to prevent further deterioration

**L**

#### **Legal requirement**

#### **852/2004 Annex II Wrapping & Packaging: Chapter X points 1, 3, 4**

**A5.** Wrapping and packaging operations are to be carried out so as to avoid contamination of the products. Where appropriate, and particularly in the case of cans and glass jars, the integrity of the container's construction and its cleanliness is to be assured.

**A6.** Wrapping and packaging material re-used for foodstuffs is to be easy to clean and, where necessary, to disinfect.

#### **A5. and A6. Compliance regarding reusable containers**

Make sure that:

- the cleanliness of reusable containers is assured
- wrapping and packaging materials re-used for foodstuffs are easy to clean and, where necessary, to disinfect

#### **A5. and A6. Good practice**

Only wrapping and packaging containers that are capable of being cleaned (for example, hard plastic) may be reused for foodstuffs and then only if they are cleaned and disinfected before reuse.

Plastic trays and dolavs need to be well maintained and not abused (for example, by forklift truck damage, cracking, deep scoring) to keep them in a suitable condition for effective cleaning and disinfection.

Containers supplied by customers must also be in a suitable condition before being accepted for use.

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**Legal requirement**

**852/2004 Annex II Wrapping & Packaging: Chapter X points 1, 3, 4**

**A5.** Wrapping and packaging operations are to be carried out so as to avoid contamination of the products. Where appropriate, and particularly in the case of cans and glass jars, the integrity of the container's construction and its cleanliness is to be assured.

**852/2004 Annex II Foodstuffs: Chapter IX point 3**

**A7.** At all stages of production, processing and distribution, food is to be protected against any contamination likely to render the food unfit for human consumption, injurious to health or contaminated in such a way that it would be unreasonable to expect it to be consumed in that state.

**A5. and A7. Compliance regarding packing operations**

- Make sure that wrapping and packaging operations are carried out so as to avoid contamination of the products.

**A5. and A7. Good practice**

Assemble boxes under hygienic conditions as close to the time of use as possible, and organise the flow of packaging into areas where exposed meat is present to limit the opportunity for cross-contamination.

If lined or coated boxes are assembled and stored for later use, stack them on their sides or opening-to-opening, so that the wrapping (for example, polythene liners) inside the boxes is not at risk of contamination. Shroud piles of assembled boxes if necessary.

To avoid contamination of unwrapped meat during packing, the meat and staff handling the meat should touch only the inner, lined or coated surfaces where the meat is being placed, and not the outer surfaces of the packaging. Otherwise, staff handling unwrapped meat and then handling packaging materials (or vice versa) should wash their hands between the two operations.

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## Legal requirement

### 853/2004 Annex III Slaughterhouses: Section I Chapter II point 2

**A8.** To avoid contaminating meat, (red meat slaughterhouses) must: (c) ensure separation in space or time of the following operations: (vi) packaging offal.

### 853/2004 Annex III Slaughterhouses: Section I Chapter VII point 5 & Section II Chapter V point 4

**A9.** Exposed meat must be stored ... separately from packaged meat, unless stored ... at different times or in such a way that the packaging material and the manner of storage ... cannot be a source of contamination for the meat.

### 853/2004 Annex III: Cutting: Section I Chapter III & Section II Chapter III; / Farmed Game: Section III points 1 & 2; / Production Establishments: Section V Chapter I & Section VI point 2

**A10.** Have rooms for the separate storage of packaged meat and exposed meat and products, unless stored at different times or in such a way that the packaging material and the manner of storage cannot be a source of the contamination for the meat.

## A8. to A10. Compliance regarding separation

- To avoid contaminating meat, red meat slaughterhouses must separate the packaging of offal in space or time.
- Store packaged meat and exposed meat separately (in time or space) so that the packaging material and storage arrangements are not a source of contamination.

## A8. to A10. Good practice

To minimise the risk of contamination, for example, of unwrapped meat from packaging or from packaged meat, store them in separate rooms, or in the same room at a different time or at the same time with either a permanent barrier between them that can be cleaned and disinfected or by using an appropriately placed polythene covering to prevent air-borne cross-contamination.



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**Legal requirement**

**852/2004 Annex II Foodstuffs: Chapter IX point 5**

**A11.** Raw materials, ingredients, intermediate products and finished products likely to support the reproduction of pathogenic micro-organisms or the formation of toxins are not to be kept at temperatures that might result in a risk to health. The cold chain is not to be interrupted. However, limited periods outside temperature control are permitted, to accommodate the practicalities of handling during...transport, storage, ... of food, provided that it does not result in a risk to health.

**A11. Compliance regarding temperature controls**

- Make sure that the cold chain is not interrupted, except for limited periods to accommodate the practicalities of handling, provided that it does not result in a risk to health.

**A11. Good practice**

Wrap and package meat without undue delay so that the cold chain can be maintained. This will minimise the growth of microbiological organisms that may spoil food or cause food poisoning. See chapter 1, 'Introduction' section 1.3 'Hazards'. The hygiene regulations set maximum temperature requirements for raw meat, including carcasses and for processed meat. See chapter 10 on 'Temperature controls'.

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Warm transport of red meat dispatch – avoid the accumulation of meat in ambient temperature dispatch areas and arrange rapid loading. However, where authorised, red meat may be transported prior to reaching 7°C throughout the meat or 3°C for offal.

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**Legal requirement**

**852/2004 Annex II Training: Chapter XII point 1**

**A12.** Food handling operators are to ensure that staff are supervised and receive instruction or training in food hygiene matters commensurate with their work activity.

**A12. Compliance regarding training, instruction and supervision**

- Make sure that food handling staff are supervised and receive instruction or training in food hygiene matters commensurate with their work activity.

**A12. Good practice**

Instruct staff about the food safety hazards associated with inadequate and unhygienic storage

and use of wrapping and packaging materials, the need to follow instructions and to report failing control measures promptly. Supervise as necessary and issue reminders to staff if lapses occur.

**Records** – keep accurate, dated individual training records to show what instruction/training has been given. See chapter 7 on 'Training'.

## B. Transport of food, including meat

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### Legal requirement

#### 852/2004 Annex II Foodstuffs: Chapter IX point 3

**B1.** At all stages of production, processing and distribution, food is to be protected against any contamination likely to render the food unfit for human consumption, injurious to health or contaminated in such a way that it would be unreasonable to expect it to be consumed in that state.

#### 852/2004 Annex II Transport: Chapter IV point 1

**B2.** Conveyances and/or containers used for transporting foodstuffs are to be kept clean and maintained in good repair and condition to protect foodstuffs from contamination and are, where necessary, to be designed and constructed to permit adequate cleaning and/or disinfection.

### B1. and B2. Compliance regarding design and layout for transport

- Make sure that at all stages of distribution, food is protected against any contamination likely to render the food unfit for human consumption, injurious to health or contaminated in such a way that it would be unreasonable to expect it to be consumed in that state.
- Use food transport vehicles that are designed and constructed to allow easy cleaning and / or disinfection.

### B1. and B2. Good practice

Consider the requirements for transport hygiene in relation to throughput, including suitable access, delivery and dispatch arrangements, with loading/unloading areas designed to avoid contamination and facilities for cleaning vehicles and containers between clean and dirty loads to avoid cross contamination.

**Loading and unloading operations** – prevent contamination of meat from fumes, dust, rain, pests, birds, leaves and other contaminants. during loading and unloading between premises and vehicles.

See chapter 2 on 'Design and facilities'.

Use vehicles that are enclosed and watertight with internal surfaces that are smooth and uniform for easy cleaning and have few crevices or sharp corners in which dirt can accumulate.

It should be possible to clean inside and outside of the vehicles using a hose or pressure wash.

# L

## Legal requirement

### 852/2004 Annex II Foodstuffs: Chapter IX point 3

**B1.** At all stages of production, processing and distribution, food is to be protected against any contamination likely to render the food unfit for human consumption, injurious to health or contaminated in such a way that it would be unreasonable to expect it to be consumed in that state.

### 852/2004 Annex II Transport: Chapter IV point 1

**B2.** Conveyances and/or containers used for transporting foodstuffs are to be kept clean and maintained in good repair and condition to protect foodstuffs from contamination and are, where necessary, to be designed and constructed to permit adequate cleaning and/or disinfection.

### 852/2004 Annex II Transport: Chapter IV points 3, 5 & 6

**B3.** Where conveyances and/or containers have been used for transporting anything other than foodstuffs or for transporting different foodstuffs, there is to be effective cleaning between loads to avoid the risk of contamination.

### Commission Regulation (EU) No 142/2011, Annex VIII, Chapter 1, points 2 and 3

**B4.** Vehicles and reusable containers ... must be maintained in a clean condition. In particular, they must be (a) clean and dry before use; (b) cleaned, washed and/or disinfected after each use to the extent necessary to avoid cross-contamination. Reusable containers must be dedicated to the carriage of a particular animal by-product or derived product to the extent necessary to avoid cross-contamination.

## B1. to B4. Compliance regarding maintenance and cleaning of vehicles

Make sure that:

- vehicles and / or containers used for transporting foodstuffs are maintained in good repair and condition
- where vehicles and / or reusable containers have been used for transporting anything other than foodstuffs or for transporting different foodstuffs, there is effective cleaning between loads to avoid the risk of contamination

## B1. to B4. Good practice

**Maintenance** – include company vehicles and food containers in the company's maintenance regime so they are inspected, maintained and repaired as necessary. See chapter 4 on 'Maintenance'.

**Cleaning** – include company vehicles and transport containers in the company's cleaning regime so they are cleaned regularly and / or whenever they become soiled with, for example, wood from pallets, nails, dust, cardboard, plastic or metal from containers, leaves and any other waste. See chapter 5 on 'Cleaning'.

Clean and disinfect vehicles and containers used to transport exposed meat between each load to minimise cross-contamination. See 'B5. to B7.'.

Keep doors of cleaned vehicles and containers closed until loading takes place to minimise the opportunities for contamination.

**F**

Alternative facilities for cleaning livestock vehicles - other arrangements than slaughterhouses can be utilised as long as they are agreed with the competent authority and official authorised places and facilities exist nearby.

**L**

#### **Legal requirement**

##### **852/2004 Annex II Transport: Chapter IV points 3, 5 & 6**

**B5.** Where conveyances and/or containers are used for transporting anything in addition to foodstuffs or for transporting different foodstuffs at the same time, there is, where necessary, to be effective separation of products.

**B6.** Foodstuffs in conveyances and/or containers are to be so placed and protected as to minimise the risk of contamination.

##### **853/2004 Annex III Section I Chapter VII point 5 and Section II Chapter V point 4**

**B7.** Exposed meat must be ... transported separately from packaged meat, unless ... transported at different times or in such a way that the packaging material and the manner of ... transport cannot be a source of contamination for the meat.

#### **B5. to B7. Compliance regarding separation of products in transport**

Make sure that:

- where vehicles and / or containers are used for transporting anything in addition to foodstuffs or for transporting different foodstuffs at the same time, products are effectively separated where necessary
- foodstuffs in vehicles and / or containers are placed and protected so as to minimise the risk of contamination
- exposed meat is transported separately from packaged meat, unless transported at different times or in such a way that the packaging material and the manner of transport cannot be a source of contamination for the meat

#### **B5. to B7. Good practice**

To minimise the risk of contamination of exposed meat from packaged meat or other goods, transport them separately, or in the same vehicle at a different time or at the same time with either a permanent barrier between them that can be cleaned and disinfected or by using an

appropriately placed polythene covering to prevent air-borne cross-contamination.

Hang carcasses high enough and securely enough so that there is no contact with the floor.

Use barriers inside the container or vehicle to separate exposed meat from other contents. Wrapping pallets with shrink film is only a temporary solution as it is quickly damaged, exposing dirty, cracked wood again. Use of wooden pallets should also be avoided.

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Separation in time and/or space – exposed and packaged meat can be transported in the same vehicle at the same time with products effectively separated.

Where viscera accompany the carcass, transport them in clean, watertight covered containers. Use tags or labels to identify each set of viscera with its carcass. See chapter 11 on 'Acceptance and slaughter of animals'.

**L**

#### **Legal requirement**

##### **852/2004 Annex II Foodstuffs: Chapter IX point 5**

**B8.** Raw materials, ingredients, intermediate products and finished products likely to support the reproduction of pathogenic micro-organisms of the formation of toxins are not to be kept at temperatures that might result in a risk to health. The cold chain is not to be interrupted. However, limited periods outside temperature control are permitted, to accommodate the practicalities of handling during ... transport ... of food, provided that it does not result in a risk to health.

#### **B8. Compliance regarding temperature controls in transport**

- Make sure that the cold chain is not interrupted, except for limited periods to accommodate the practicalities of handling during transport, provided that it does not result in a risk to health.

#### **B8. Good practice**

Load and unload carcasses and exposed meat quickly so that the cold chain can be maintained. This will minimise the growth of microbiological organisms that may spoil food or cause food poisoning. See chapter 1 'Introduction' section 1.3 on 'Hazards'.

The hygiene regulations set maximum temperature requirements for raw meat, including carcasses and for processed meat. See chapter 10 on 'Temperature controls'.

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**Legal requirement**

**852/2004 Annex II Training: Chapter XII point 1**

**B9.** Food business operators are to ensure food handlers are supervised and instructed and/or trained in food hygiene matters commensurate with their work activity.

**B9. Compliance regarding training, instruction and supervision**

- Make sure that food handlers are supervised and instructed and / or trained in food hygiene matters commensurate with their work activity.

**B9. Good practice**

Instruct staff, especially company drivers and loading/unloading staff about the food safety hazards associated with transport, including the need for effective cleaning, separation of clean/dirty loads and exposed/packaged meat, the need to follow instructions and to report failing controls promptly. Supervise as appropriate and issue reminders if lapses occur.

Keep accurate individual training records to show what instruction/training has been given. See chapter 7 on 'Training'.

**17.4. Official control requirements**

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**Legal requirement**

**854/2004 Article 4 points 4c and 4l**

Audits by officials of good hygiene practices shall verify that meat plant operators apply ... post-operational hygiene procedures and controls on food entering and leaving the establishment continuously and properly.

**854/2004 Article 4 point 5**

Audits by officials of HACCP – based procedures shall verify that meat plant operators apply such procedures continuously and properly.