

# Chapter 10 Temperature Controls

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## 10. Introduction

Warm and wet meat provides the ideal conditions for growth of food poisoning and spoilage bacteria. A combination of low temperatures and dry surfaces will inhibit the growth of bacteria and extend shelf life. Bacteria can multiply quickly if meat is stored or transported at too high a temperature or if heat treatment is inadequate. Procedures are needed to minimise the risk of this hazard causing illness to consumers.

Examples demonstrating the importance of temperature controls:

<b>Problem</b>	<b>Effect</b>	<b>Possible outcome</b>
Failure to maintain the cold chain	Growth of bacteria on meat; the higher the temperature the faster bacteria can multiply	A source of microbiological contamination resulting in a serious food safety hazard
Inadequate chilling of cooked meat	Growth of bacteria on meat; the higher the temperature the faster bacteria can multiply	Increased chance of contamination of food products by food poisoning bacteria (such as Salmonella)
Inadequate heat treatment	Failure to maintain high enough temperatures for a sufficient time	Heat-resistant food-poisoning or spoilage organisms will not be destroyed resulting in a source of microbiological contamination

### **10.1. Temperature requirements for meat in approved premises**

The specific temperature requirements of Regulation 853/2004 for raw and processed meat are included in the following chapters:

- 'Dressing of carcasses'
- 'Cutting of meat'
- 'Meat processing'

### **10.2. Temperature requirements outside approved premises**

Operators exempt from Regulation 853/2004 are generally subject to Regulation 852/2004. Those regulations include:

**Article 4.2** - which requires operators carrying out any stage of production, processing and distribution of food after primary production, to comply with the general hygiene requirements laid down in Annex II (of Regulation 852/2004).

**Article 4.3** - which requires operators, as appropriate, to adopt the following specific hygiene measures:

- (c) compliance with temperature control requirements for foodstuffs
- (d) maintenance of the cold chain

These requirements should be reflected in relevant operators' HACCP-based procedures. See chapter 1 'Introduction' for detailed information on regulations.

### 10.3. Legal requirements for temperature controls

The following sections set out the general temperature control requirements of the regulations that apply to slaughter, dressing and further processing of meat.

#### A. General requirements

**L**

##### Legal requirement

##### **852/2004 Annex II Food Premises: Chapter I point 2(d)**

**A1.** The layout, design, construction, siting and size of food premises ... where necessary, provide suitable temperature-controlled handling and storage conditions of sufficient capacity for maintaining foodstuffs at appropriate temperatures and designed to allow those temperatures to be monitored and, where necessary, recorded.

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

**A2.** ... 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 and sufficient separate refrigerated storage.

##### **853/2004 Annex III Section I Red meat slaughterhouses: Chapter II point 5**

**A3.** (Slaughterhouses have) lockable facilities for the refrigerated storage of detained meat.

##### **853/2004 Annex III Section I Red meat cutting plants: Chapter III point 3; Section II White meat slaughterhouses: Chapter III point 1(c). Section V Production Establishments: Chapter I point 3**

**A4.** Cutting plants/production establishments are equipped to ensure compliance with the (temperature) requirements laid down in Chapter V (for red and white meat) Chapter III (for production establishments).

#### **A1. to A4. Compliance regarding temperature control facilities**

- Provide sufficient temperature controlled handling and storage capacity.
- Provide suitable rooms, large enough for the separate storage of raw materials from processed material and sufficient separate refrigerated storage, if manufacturing, handling and wrapping processed foodstuffs.
- Slaughterhouses are to have lockable facilities for the refrigerated storage of detained meat.
- Cutting / preparation rooms are equipped to comply with temperature requirements for meat.

#### **A1. to A4. Good practice**

Maintenance of the cold chain is essential to minimise the growth of bacteria on meat - see 'B. Maintaining the cold chain'.

Consider the need for sufficient temperature controlled handling and refrigerated storage facilities to prevent overloading, particularly for anticipated throughput at peak periods. Consider the implications of equipment failure and other emergency situations, and the need to monitor temperatures.

Consider the requirements for handling meat of different species, detained meat, separation of raw materials from processed material and exposed meat from packaged meat in slaughterhouses, cutting plants and processing plants, as appropriate.

**Food premises** – see chapter 2 on ‘Design and facilities’ at ‘A15.’, including free-standing chillers.

**Detained meat** – see chapter 2 on ‘Design and facilities’ at ‘D10. Detaining meat’.

**Cutting rooms** – see chapter 14 on ‘Cutting of meat’ at ‘C3. Warm cutting of red meat at co-located premises’, ‘C1. and C7. Warm transport of red meat’, ‘C9. Cutting of chilled red meat’, ‘C11. Warm cutting of white meat at co-located premises’.

**L**

#### **Legal requirement**

##### **852/2004 Annex II Food Premises: Chapter I point 2(d)**

**A5.** ... where necessary, provide suitable temperature-controlled handling and storage conditions ...designed to allow those temperatures to be monitored and, where necessary, recorded.

##### **852/2004 Annex II Equipment: Chapter V point 2**

**A6.** Where necessary, equipment is to be fitted with any appropriate control device to guarantee fulfilment of this Regulation’s objectives.

#### **A5. and A6. Compliance regarding temperature monitoring**

- Temperature controlled handling and storage allows temperatures to be monitored and if necessary recorded.
- Where necessary, equipment is fitted with an appropriate control device to guarantee fulfilment of the objectives of Regulation 852/2004.

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

While controlling the temperature of the surface of meat is most important for food safety, as microbiological contamination is generally confined to the surface of carcasses, the legal requirements for meat apply to the whole product, whether carcass meat, mince or other product.

Set limits and tolerances for the operation of chillers, freezers or thermal processing equipment that will achieve and maintain the required temperatures for the product. These may include:

- chiller / freezer / cooker air temperature
- relative humidity, airflow or other parameters
- temperature of product entering / leaving

- loading levels and spacing between product
- loading and unloading times / frequency

Check, at the frequency set out in the company's HACCP plan, that the established limits and procedures are being adhered to and are effective.

Automatic monitoring devices can activate audible and visible alarms when temperature limits are close to being breached so corrective action can be taken. Such equipment also produces records of temperature control. Alternatively, physically check and then record temperatures at the frequencies determined in the company HACCP plan. Record any corrective action taken. See 'Annex 1.'

**Internal temperature measurement** – the internal temperature of meat can be measured using a suitable hand-held probe thermometer. This should be of hygienic design and construction and cleaned and disinfected after each use so that it does not contaminate the food.

**Calibration** – make sure that thermometers/control devices are working accurately by checking each one regularly (and at any time there is reason to think there may be a defect) against a recognised standard. Keep a record of the equipment / individual thermometer number and the date and outcome of the check.

**L**

**Legal requirement**

**852/2004 Annex II Transport: Chapter IV point 7**

**A7.** Where necessary, conveyances and/or containers used for transporting foodstuffs are to be capable of maintaining foodstuffs at appropriate temperatures and allow those temperatures to be monitored.

**A7. Compliance regarding temperature-controlled transport**

- Use vehicles and containers for transporting foodstuffs that are, where necessary, capable of maintaining foodstuffs at appropriate temperatures and allowing those temperatures to be monitored.

**A7. Good practice**

As there are specific temperature requirements for transport of meat, vehicles and / or containers used for transporting meat need to be capable of maintaining the cold chain, unless specific exemptions apply. See chapter 14 on 'Cutting of meat' at 'C1. and C7. Warm transport of red meat'.

Transport vehicles should be used to maintain the cold chain not to reduce the temperature of the meat to the required level.

Set limits and tolerances for the transport of meat that will maintain the required temperatures for the product. These may include:

- vehicle air temperature
- relative humidity, airflow or other parameters
- temperature of product entering / leaving
- loading levels and spacing between product
- loading and unloading times / frequency

Check, at the frequency set out in the company's HACCP plan, that the established limits and procedures are being adhered to and are effective.

A well designed refrigerated vehicle should have a high standard of insulation, good internal lining, air-tight door seals, water-tight flooring, efficient refrigeration unit(s), and temperature indicators in the driver's cab so that the temperature can be continuously monitored and recorded during transport.

Purpose built vehicles will have a thermometer fitted, which will generally give a reading of the air temperature rather than the product temperature. Product temperature can be monitored with a hand-held thermometer and recorded at the frequencies set out in the HACCP plan. Record any corrective action taken. See 'Annex 1.'

**L**

**Legal requirement**

**852/2004 Annex II Food Premises: Chapter I points 2(b) & 5**

**A8.** The layout, design, construction, siting and size of food premises are to:  
b) be such as to protect against ... the formation of condensation or undesirable mould on surfaces;

**A9.** There is to be suitable and sufficient means of natural or mechanical ventilation.

**853/2004 Annex III Section I Storage and Transport: Chapter VII point 2**

**A10.** During the chilling operations, there must be adequate ventilation to prevent condensation on the surface of the meat.

**A8. to A10. Compliance regarding condensation**

- Prevent condensation on surfaces, including the surface of meat.

**A8. to A10. Good practice**

Condensation needs to be controlled as moisture encourages the growth of microbiological organisms on the surfaces of the meat. It can be minimised by having adequate insulation and increasing air circulation rates in chilling rooms to lower the relative humidity.

See chapter 2 on 'Design and facilities' at 'A4. and A5.'

**L**

**Legal requirement**

**852/2004 Annex II Premises: Chapter I point 1**

**A11.** Food premises are to be kept clean and maintained in good repair and condition.

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

**A12.** 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.

**A11. and A12. Compliance regarding maintenance and cleaning**

- Make sure that premises as well as vehicles and / or containers used for transporting foodstuffs are kept clean and maintained in good repair and condition.

**A11. and A12. Good practice**

Surfaces need to be smooth, durable, and watertight.

**Maintenance** - include temperature controlled areas and company vehicles and food containers in the company's maintenance regime so they are inspected, maintained and repaired as necessary.

Refrigeration and heat treatment equipment may need maintenance by specialist engineers. Defrost as often as necessary to prevent loss of refrigeration efficiency. See chapter 4 on 'Maintenance'.

**Cleaning** – include all temperature-controlled areas, company vehicles and transport containers in the company's cleaning regime so they are cleaned regularly and / or whenever they become soiled. See chapter 5 on 'Cleaning'.

**L**

**Legal requirement**

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

**A13.** Food business operators are to ensure that food handlers are supervised and instructed and/or trained in food hygiene matters commensurate with their work activity.

**A13. Compliance regarding training, instruction and supervision**

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



**A13. Good practice**

Instruct all food handlers (including temporary staff) in the importance of temperature controls, 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'.

## B. Maintaining the cold chain

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### Legal requirement

#### 852/2004 Article 5 point 1

**B1.** Food business operators shall put in place, implement and maintain a permanent procedure or procedures based on the HACCP principles.

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

**B2.** At all stages of production, processing and distribution, food is to be protected against any contamination likely to render food unfit for human consumption, injurious to health or contaminated in such a way that it would be unreasonable to be consumed in that state.

### B1. and B2. Compliance regarding HACCP-based procedures

- Implement and maintain a permanent procedure or procedures based on the HACCP principles.
- Protect food against any contamination likely to render food unfit for human consumption.

### B1. and B2. Good practice

In many cases, temperature control may be regarded as a prerequisite requirement. However, there are specific temperature requirements for raw and processed meat in Regulation 853/2004. As a result, operators of approved establishments (slaughterhouses, cutting plants, game handling establishments and meat processing plants) need to ensure that food safety hazards, notably the growth of bacteria through inadequate temperature control, are minimised. This is achieved by setting and applying operational limits and procedures for chilling and subsequent maintenance of the cold chain (for example, during storage and transport) and, where appropriate, freezing, thawing, and thermal processing.

Set out in the HACCP plan, the procedures for controlling temperature, the limits that are to be monitored, the checks to be carried out, the corrective actions to be taken to ensure the safety of the meat and the records to be kept of those checks and actions.

See '10.5. Applying procedures continuously and properly' and the chapter on 'Application of HACCP principles'.

**Microbiological testing** – can help confirm (validate / verify) the effectiveness of HACCP-based procedures. See chapter 13 and section 13.2 on 'Microbiological criteria' at 'process hygiene criteria'.

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### Legal requirement

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

**B3.** 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 preparation, transport, storage, display and service of food, provided that it does not result in a risk to health.

### B3. Compliance regarding maintaining the cold chain

- The cold chain is not to be interrupted. However, limited periods outside temperature control are permitted, to accommodate the practicalities of handling during preparation, transport, storage, display and service of food, provided that it does not result in a risk to health.

### B3. Good practice

Once carcasses, cut or processed meat is chilled down to legal temperatures or below, maintain those temperatures during storage and transport to minimise the opportunity for the growth of spoilage and food poisoning organisms.

**Interruptions to the cold chain** - keep interruptions to the cold chain to a minimum. Lengthy periods outside temperature control are not covered by the exemption for 'limited periods, to accommodate the practicalities of handling'. See 'B1. and B2.'.

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Maintaining the cold chain - limited periods outside temperature control are allowed to accommodate the practicalities of handling during preparation, transport, storage, display and service of food, provided it does not result in a risk to public health.

**Dispatch** - keep interruptions to the cold chain to a minimum by, for example, having refrigerated dispatch areas, or by avoiding the accumulation of meat in ambient temperature dispatch areas and arranging rapid loading. Transfer meat to vehicles hygienically.

**Transport** - transport vehicles should be used to maintain the cold chain not to reduce the temperature of the meat to the required level. Keep interruptions to the cold chain to a minimum by, for example, opening vehicle doors as little as possible to help maintain the correct temperature, especially during hot weather. Transfer meat to chilled storage immediately on arrival. See 'A7.'.

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Cutting / processing - maintain meat at or below the required temperatures during cutting, boning, trimming, slicing, dicing, processing, wrapping and packaging. See chapter 14 on 'Cutting of Meat'. Meat can be kept at or below the required temperatures by maintaining a low ambient temperature in the cutting room or by using other methods.

Keep interruptions to the cold chain to a minimum by, for example, keeping meat packed and in chilled storage until it is to be worked on in the cutting room. Once it is cut, transfer meat promptly to refrigerated storage. Particular care is needed where the rate of accumulation can compromise temperature control, for example, where trim is gathered from the processing of larger cuts but it may take several hours for containers to be filled and moved to chilled storage.

**Temperature checks** – check at intervals that the meat is cooling and then stays at or below the required temperatures during storage and before (and if the journey is long) during transport. It may be sufficient to check the air temperature during transport. See 'A5. and A6.'

**Temperature records** – keep a written note of the temperatures found when checking, unless there is an automatic recording system (for example, vehicle thermograph charts).

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#### **Legal requirement**

##### **852/2004 Article 5 point 1**

**B1.** Food business operators shall put in place, implement and maintain a permanent procedure or procedures based on the HACCP principles.

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

**B2.** At all stages of production, processing and distribution, food is to be protected against any contamination likely to render food unfit for human consumption, injurious to health or contaminated in such a way that it would be unreasonable to be consumed in that state.

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

**B3.** 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 preparation, transport, storage, display and service of food, provided that it does not result in a risk to health.

#### **B1. to B3. Compliance regarding chilling and the cooling curve**

- Chill meat and maintain the temperature of meat at or below legal limits.

### B1. to B3. Good practice

After slaughter and dressing the internal temperature of an animal carcass will generally be between 30°C and 39°C. This warm and wet surface provides ideal conditions for growth of food poisoning organisms. Chilling and drying restricts microbiological activity as well as chemical and physical changes that cause deterioration and spoilage. The reduction of internal carcass temperature to below 7°C for red meat, 3°C for offal and 4°C for white meat occurs along a 'cooling curve'.

Different time / temperature regimes may be followed for the progressive chilling of meat for different species / products as long as food safety is not prejudiced. Beef carcasses, for example, may take 48 hours to fall below 7°C. The rate at which meat will chill to these temperatures or below is determined by:

- **Chiller temperature and efficiency** – determine appropriate settings and tolerances for temperature, air speed, air flow and relative humidity. Keep chiller door opening and closing to a minimum. Maintain equipment in good condition. Allow adequate space for air to circulate.
- **Chiller capacity** – avoid overloading chilling rooms, freezer rooms or chilled storage rooms beyond their designed capacity. Hang meat or place in corrosion-resistant, easily cleanable trays. Avoid condensation and prevent drips from one piece of meat contaminating another.
- **Relative humidity** – surface growth of mould on meat is controlled by temperature and the relative humidity of the atmosphere, both of which must be as low as possible.
- **Carcass temperature** – the higher the temperature the more heat needs to be removed, so initial reduction to ambient temperature is recommended.
- **Carcass size and composition** – proportion of meat, external fat and bone, which have different thermophysical properties.

**Cold shortening** - occurs when muscles contract in temperatures of about 10°C as a result of cooling too quickly before rigor has taken place. It can be avoided by delaying the start of chilling until the pH is below 6.2 or by electrical stimulation to bring forward the onset of rigor.

**Immersion chilling of poultry** – see chapter 12 on 'Dressing of carcasses' at 'D16'.

**Vacuum packing** - meat can be packed in gas-permeable plastic laminate bags at 2-4°C and a pH of 5.5-5.8 and stored at between -18°C and 1°C. Residual oxygen is used and carbon dioxide accumulates. Without air and water bacterial growth is significantly reduced. The meat regains its red colour on re-exposure to air.

See chapter 12 on 'Dressing of carcasses' at 'C. Dressing of domestic ungulates and large game' and 'D. Dressing of poultry and lagomorphs including game', chapter 14 on 'Cutting of meat' at 'C3.' 'C4. to C6.', 'C1. and C7.', 'C11.', 'C11. to C13.', and 'C14.', and chapter 15 on 'Meat processing' at 'C. Minced meat', 'D. Meat preparations', 'E. MSM' and 'G. Meat products'.



**Legal requirement**

**853/2004 Annex III Section I Storage and Transport: Chapter VII point 4**

**B4.** Meat intended for freezing must be frozen without undue delay, taking into account where necessary a stabilisation period before freezing.

**B4. Compliance regarding freezing meat**

- Meat intended for freezing must be frozen without undue delay, taking into account where necessary a stabilisation period before freezing.

**B4. Good practice**

Allow meat to cool before it is placed in a freezer to minimise condensation and temperature fluctuations in the freezer.

The freezing point of meat lies between -1 and -1.5°C. Microbiological organisms stop growing at -8°C as available water forms ice crystals, but they are not destroyed. At -10°C 94% of the muscle water is ice. Spores are generally resistant to freezing. Maintain a constant storage temperature in the freezer as far as possible to minimise ice recrystallisation.

See 'Quick-freezing' (below) and chapter 15 on 'Meat processing' for specific requirements for mince, meat preparations, MSM and meat products.

**Frozen storage** - the determination of the storage period for frozen meat is largely a quality issue. Set limits and tolerances for the frozen storage. Frozen meat stored for too long can become dry and rancid. Species, storage temperature, fluctuation in temperature and type of wrapping / packaging will affect frozen storage life. Meat stored at -18°C or lower will keep longer than for meat stored at -12°C.

**Quick-freezing** - food that is specifically labelled or described as 'quick-frozen' is to be kept at or below -18°C.

See 'Quick-frozen Regulations' at: [www.legislation.gov.uk/ukxi/2007/191/contents/made](http://www.legislation.gov.uk/ukxi/2007/191/contents/made).

L

### Legal requirement

#### 852/2004 Annex II Foodstuffs: Chapter IX point 7

**B5.** The thawing of foodstuffs is to be undertaken in such a way as to minimise the risk of growth of pathogenic micro-organisms or the formation of toxins in the foods. During thawing, foods are to be subjected to temperatures that would not result in a risk to health.

Where run-off liquid from the thawing process may present a risk to health it is to be adequately drained. Following thawing, food is to be handled in such a manner as to minimise the risk of growth of pathogenic micro-organisms or the formation of toxins.

### B5. Compliance regarding thawing

Make sure that:

- thawing is undertaken in a way that minimises the risk of growth of bacteria or the formation of toxins
- during thawing, foods are subjected to temperatures that would not result in a risk to health
- following thawing, food is handled in such a manner as to minimise the risk of growth bacteria or the formation of toxins
- where run-off liquid from the thawing process may present a risk to health it is adequately drained

### B5. Good practice

Microbiological organisms stop growing at - 8°C as available water turns to ice, but they are not destroyed. Thawing of meat releases some liquid or 'drip' and provides the conditions for bacterial growth. Take care when opening and removing any packaging that contains such liquid to prevent it leaking on to other meat, packaging or surfaces.

The most damaging effect on meat products is due to ice re-crystallisation as a result of temperature fluctuation, so thawing should take place under controlled conditions.

Establish time / temperature limits and conditions for thawing meat. Do not allow the legal maximum temperatures for meat to be exceeded. Check, at the frequency set out in the company's HACCP plan, that the established limits and procedures are being adhered to and are effective.

**Re-freezing** – products with a high bacterial load should not be refrozen after thawing in an attempt to improve food safety. See chapter 15 on 'Meat processing' for specific requirements for mince, meat preparations, MSM and meat product.

### C. Heat treatment: hermetically sealed containers

**L**

#### Legal requirement

#### 852/2004 Annex II Heat Treatment: Chapter XI points 1-3

The following requirements apply only to food placed on the market in hermetically sealed containers:

**C1.** Any heat treatment process used to process an unprocessed product or to process further a processed product is:

- (a) to raise every part of the product treated to a given temperature for a given period of time; and
- (b) to prevent the product from becoming contaminated during the process.

**C2.** The process used should conform to an internationally recognised standard (for example, pasteurisation, ultra high temperature or sterilisation).

#### C1. and C2. Compliance regarding heat treatment: hermetically sealed containers

Make sure that for food sold in hermetically sealed containers:

- any heat treatment process used to process an unprocessed product or to process further a processed product:
  - raises every part of the product treated to a given temperature for a given period of time; and
  - prevents the product from becoming contaminated during the process
- the process conforms to an internationally recognised standard (for example, pasteurisation, ultra high temperature or sterilisation)

#### C1. and C2. Good practice

Canning of food in a permanently sealed container and subject to heat for a specific period of time and cooled will destroy nearly all organisms and the seals will prevent re-infection.

Heat treatment should not be undertaken without careful consideration of:

- the main factors affecting growth and destruction of micro-organisms and inactivation of enzymes
- variables affecting heat penetration, such as viscosity, solid / liquid ratio, and meat type and composition
- individual product formulation and preparation procedure

**Standards** – internationally recognised standards have, for example, been developed by Codex Alimentarius: [www.codexalimentarius.net/search](http://www.codexalimentarius.net/search).



Guidance is available from a number of different organisations; these are listed in chapter 1 'Introduction' in section 1.6 'Useful contacts'.

**L**

**Legal requirement**

**852/2004 Annex II Heat Treatment: Chapter XI points 1-3**

**C3.** To ensure that the process employed achieves the desired objectives, food business operators are to check regularly the main relevant parameters (particularly temperature, pressure, sealing and microbiology), including by the use of automatic devices.

**C3. Compliance regarding process parameters**

- Confirm that the process achieves the desired objectives, by checking regularly the main parameters (particularly temperature, pressure, sealing and microbiology), including the use of automatic devices.

**C3. Good practice**

Precise heat processing conditions may need to be determined experimentally (validated) for each product before being described in the HACCP plan. Key criteria for must be monitored regularly either visually or, where appropriate, by automatic equipment fitted with alarms.

Set out in the HACCP plan, the procedures for controlling heat treatment, the limits that are to be monitored, the checks to be carried out, the corrective actions to be taken to ensure the safety of the meat and the records to be kept of those checks and actions.

## 10.4. Official control requirements

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### Legal requirement

#### 854/2004 Article 4 point 4h

Audits by officials of good hygiene practices shall verify that meat plant operators apply temperature controls continuously and properly.

#### 854/2004 Article 4 point 5

Audits by officials of HACCP-based procedures shall verify that food business operators apply such procedures continuously and properly.

## 10.5. Applying procedures continuously and properly

L

### Legal requirement

#### 853/2004 Article 1 point 1a

The operator is responsible for food safety in the food business.

#### 852/2004 Article 5 point 1

Food business operators shall put in place, implement and maintain a permanent procedure or procedures based on the HACCP principles.

#### 178/2002 Article 17

Food...business operators at all stages of production, processing, and distribution within the businesses under their control shall ensure that foods...satisfy the requirements of food law which are relevant to their activities and shall verify that such requirements are met.

### 10.5. Compliance regarding operator responsibilities for temperature controls

- Operator responsibility includes applying and verifying the company's temperature control procedures and taking corrective action if those procedures fail.
- Implement and maintain a permanent procedure or procedures based on the HACCP principles.

### 10.5. Good practice

**Operator responsibility** - includes maintaining and monitoring temperature control procedures and taking corrective action if there is a failure. These procedures should be based on HACCP principles. See 'B1. and B2.' and chapter 9 on 'HACCP principles'.

**Delegation** - responsibility for applying and verifying the company's temperature control procedures may be delegated to a nominated person to whom problems are reported, and who has sufficient authority to ensure that corrective action is taken when necessary.

**Verification** – check at least daily that staff are following the company's temperature control procedures (including heat treatment if appropriate). Work of new or temporary people who are less familiar with the procedures and premises may need to be monitored more frequently.

**Records** – keep an accurate, dated account (for example, in a Food Safety Management diary / daybook) of each periodic check and of any corrective action taken.

**Corrective action** – take action when failures of the company's temperature control procedures are identified. Such action may include:

- dealing with any product that has been outside the cold chain
- dealing with equipment failures
- establishing the underlying cause and what needs to be done to prevent similar incidents in the future
- improving staff instructions and training

**Annex 1. Weekly temperature log example**

## Weekly Temperature Log:

Week commencing.....

Doc Number:.....

(Insert location/operations at which temperatures are to be taken e.g. room/sterilizer/chiller/product at intake/stages of production/storage/despatch – two or more forms may be needed)

	Time									Signed
<b>MONDAY</b>										
<b>TUESDAY</b>										
<b>WEDNESDAY</b>										
<b>THURSDAY</b>										
<b>FRIDAY</b>										
<b>SATURDAY</b>										
<b>SUNDAY</b>										

Meat temperatures should be 4-7°C or below  
 Mince temperatures during processing should be 4-5°C or below  
 Mince temperature at despatch should be 2°C or below  
 Sausage temperature at despatch should be 4°C or below  
 Sterilizer temperatures should be 82°C or above  
 Cutting room air temperature should be \_\_\_\_\_ °C or below  
 Fridge temperatures should be \_\_\_\_\_ °C or below  
 If temperatures are elevated, take the following action :.....