



# Economic and Social Council

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## Economic Commission for Europe

Steering Committee on Trade Capacity and Standards

Working Party on Agricultural Quality Standards

Specialized Section on Standardization of Meat

Thirty-first session

Geneva, 28 and 29 August 2023

Item 5 of the provisional agenda

Revision of standards: Bovine Meat – Carcasses and Cuts

### Proposed revisions to the Standard for Bovine Meat – Carcasses and Cuts

Submitted by the rapporteur's group

#### *Summary*

At its 2022 session, the Specialized Section agreed to initiate a review of the entire Standard for Bovine Meat – Carcasses and Cuts. During the first half of 2023, the standard has been discussed in a rapporteur's group led by the delegation of Australia and including the delegation of Poland and experts from Instituto Nacional de Carnes in Uruguay, Universidade Federal de Goiás, Brazil, and the International Meat Research 3G Foundation. The rapporteur's group submitted the attached proposed texts for consideration of the Specialized Section.

The text consists of two parts. The first part consists of a proposal to add two cuts to the standard. The second is a proposed expanded text on meat quality standards, which builds on the text that is currently in section 5.7 of the Standard and describes aspects of quality assessment.

The Specialized Section is invited to consider the proposed addition of the two cuts (D-rump and shin special trim) to the standard.

The Specialized Section is also invited to review the expanded text on meat quality standards proposed by the rapporteur's group and discuss if it should be added to the standard, and if so, whether it should replace the current section 5.7 (i.e. as a subsection to chapter 5 on carcasses and cuts descriptions), if it should be part of another chapter, a separate (new) chapter, an annex, or a separate document.



## I. Proposed additions of cuts

### A. D-rump

*D-rump 2100*

D-rump is prepared from a rump (item 2090) by the removal of the tail (flank), by a cut following the natural seam between the *M. gluteus medius* and *M. tensor fascia latae* removing all of the tail from the lateral surface.

To be specified:

- Heavy connective tissue removed.

**HS:** 020130, 020230

#### Proposed pictures

*Image*



*Skeletal*



## B. Shin special trim

### *Shin special trim 2365*

Shin special trim is derived from shin / shank (item 2360) and is prepared into individual muscles or specified muscle groups. The maximum tendon length on all muscles is 15 mm, which may be measured from either end of the muscle. Muscle grouping may be identified in the following manner:

Group A – *M. peroneus tertius* (of extensor group)

Group B – *M. flexor digitorum superficialis* (of heel muscle)

Group C – *M. biceps brachii* (conical muscle)

Individual muscle names can also be used in the product description e.g. conical muscle.

To be specified:

- Skin and connective tissue removed or retained
- Specify muscle group listed as Group A to C.

**HS:** 020130, 020230

### **Proposed pictures**

*Image*



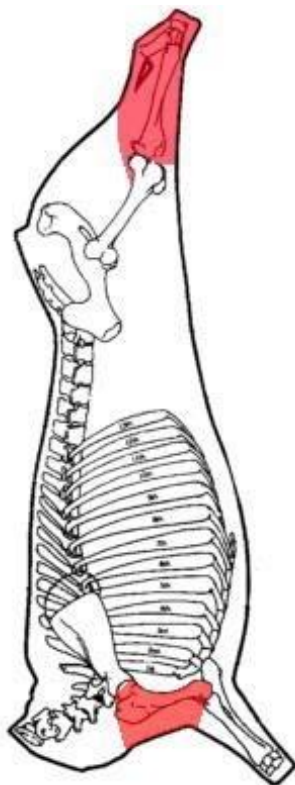
GROUP A



GROUP B



GROUP C

*Skeletal*

## II. Proposed revised text on meat quality standards

### 1. Bovine carcass assessment

The following bovine meat quality standards are a benchmark for the measurement of the salability and eating quality characteristics of bovine carcasses using a uniform set of standards under controlled conditions. Assessments are to be made by qualified eligible assessors and the results are recorded for each carcass assessed, and provide a means of (carcass) selection according to individual contract specifications prior to packaging.

Assessment results also allow producers to select breeding stock based on performance and to customize feeding regimes to suit particular markets.

These characteristics include the colour of meat and fat, the amount of marbling of the carcass skeletal ossification and pH measurement standards.

*[Picture carcass assessment]*

### 2. Carcass pre-assessment conditions

#### **Carcass presentation for assessment**

Carcasses, sides, or quarters are presented in a manner that will allow sufficient time and space for the assessor to effectively perform the assessment. All sides or quarters must be present at the time of assessment.

Beef carcasses may be ribbed at any site between (caudal) to the 5th and 13th rib except for veal carcasses which may be assessed at any site between (caudal) to the 4th and 13th rib.

The assessment site must be below the assessor's eye level and at a height that allows the assessor to use approved viewing angles.

### Assessment site presentation

There are two approved ribbing methods for carcass assessment

- (i) Full ribbing method
- (ii) Spencer roll method

#### *The full ribbing method*

The *M. longissimus dorsi* must be sufficiently exposed using the full ribbing method to provide an unrestricted view of the assessment site and allow unrestricted use of lighting, marbling, meat colour and fat colour reference standards and the calculation of the eye muscle area (EMA).

*[image of full ribbing method]*

#### *The Spencer roll method*

The Spencer roll must be sufficiently freed from its rib attachment to provide an unrestricted view of the assessment site and allow effective use of lighting, marbling, meat colour (beef/veal) and fat colour reference standards. The Spencer roll method is unsuitable for measurement of EMA.

*[image of Spencer roll ribbing method]*

Prior to assessment commencing, the assessment site must be inspected to ensure that the site does not have traces of bone dust or any other defects that may affect the accuracy of the assessment.

The assessment site surface must not be twisted or undulating.

### Carcass ribbing and assessment time constraints

To ensure carcasses have met their ultimate pH prior to assessment, ribbing and assessment must only proceed after the following period post slaughter has elapsed:

- (i) 8 hours, where carcasses have been effectively electrically stimulated; or
- (ii) 18 hours, where carcasses have not been effectively electrically stimulated
- (iii) Other time periods approved under a controlled pH decline system.

### Ultimate pH

Electrical inputs accelerate the rate of pH decline and, therefore, will reduce the time for the ultimate pH to be reached. Carcasses that receive no electrical inputs and are chilled rapidly may take 24 or even 48 hours for the ultimate pH to be achieved; however, in commercial practice, most carcasses will be at, or very close to, their ultimate pH by 18 hours. Chiller assessment cannot be undertaken until the loin muscle has reached its ultimate pH.

Carcasses that have received several electrical inputs may reach their ultimate pH within a few hours of slaughter and, thus, can be assessed at an earlier time than would otherwise be permissible.

### Controlled pH decline system

The rate of pH decline can impact on the predictability of eating quality, specifically by falling too slow and therefore increasing the potential for cold shortening or by falling too fast and increasing the probability of heat shortening.

The well documented “cold shortening” effect can be controlled by ensuring that electrical input levels are set so that the pH of the *M. longissimus dorsi* falls to below pH 6.0 before the temperature falls below 15°C.

The potential for “heat shortening” can be controlled by ensuring that electrical input levels are set so that the pH of the *M. longissimus dorsi* does not fall below pH 6.0 with the temperature above 35°C.

To ensure optimal eating quality the pH of the *M. longissimus dorsi* must

- (i) remain at or above pH 6.0 while the temperature of the muscle is at or above 35°C; and
- (ii) be below pH 6.0 prior to the temperature of the muscle falling below 15°C.

*[image of pH / Temperature window requirements]*

Assessment must not commence until 20 minutes has elapsed after ribbing or refacing, or until an additional period has concluded if a greater time lapse is necessary to allow the meat surface to effectively bloom.

Assessment may continue until 3 hours post ribbing or refacing. Assessment may only continue whilst there is no evidence that the colour at the assessment site has progressed past the blooming stage.

Where an oxygen impermeable film has been applied to the exposed *M. longissimus dorsi* immediately after ribbing, the time requirements of these standards apply from the time at which the film is removed.

Where the time post ribbing has exceeded 3 hours without the application of an oxygen impermeable film, the assessment site shall be refaced prior to assessment by removing a minimum of 3 mm of meat and fat tissue. The assessment site will also need to be refaced where there is evidence of assessment site damage.

#### **Temperature of carcass prior to assessment**

Assessment may only proceed providing the temperature of the *M. longissimus dorsi* is 12°C or below. The recommended temperature for assessment is between 4°C and 8°C.

The muscle temperature must be taken by inserting the thermometer probe or shaft into the centre of the *M. longissimus dorsi* parallel to and approximately 25 mm cranial to the assessment surface.

### **3. Carcass assessor technique**

#### **Assessment position**

Measurements conducted at the assessment site must be determined with the assessor standing within the position boundaries. The assessment site must be always below the assessor's eye level.

The angle from the assessor's eye to the assessment surface must be between 35 and 50 degrees for beef and between 45 and 70 degrees for veal and should remain constant for all assessments. The assessment standards must be held in a position that eliminates light reflection and shadows.

*[image of technique and positioning]*

#### **Lighting requirements**

The standard light source must be held at a distance from the assessment site that provides a light intensity at the *M. longissimus dorsi* of between 1,400 lux and 3,000 lux with an even distribution of light.

The light intensity must be determined using a light meter that is held as close as possible to the assessment site and at a similar distance from the torch to the distance between the torch and the assessment site during assessment. The light must be aimed directly at the light meter receptor and the light meter receptor must be at as near as possible to 90 degrees to the direction of the light beam.

#### 4. Meat quality standard measurements

Meat quality standards are made available to persons who have participated in a certified training course and have the recognised knowledge and skills to be able to perform the duties as described in this chapter.

##### Meat colour

Meat colour is the predominant colour of the rib eye muscle (*M. longissimus dorsi*). Meat colour (beef and/or veal) is assessed on the chilled carcass at the bloomed surface of the rib eye muscle area (*M. longissimus dorsi*) and is scored against the colour reference standards.

Where the meat colour falls between two of the reference standards, the number corresponding to the darker of the reference standards shall be assigned to the carcass.

If the meat colour matches that of an individual meat colour reference standard the carcass is given the score of that reference standard.

Beef meat colour standards range – (1A) to (7). Veal meat colour standards range – (V1) to (V5)

*[Image of meat colour and reference standards]*

##### Fat colour

Fat colour is the intermuscular fat lateral to the rib eye muscle. Fat colour is assessed on the chilled carcass and scored against the fat colour reference standards. Fat colour is assessed by comparing the intermuscular fat colour lateral to the *M. longissimus dorsi* muscle and adjacent to the *M. iliocostalis* with reference standards.

Where the fat colour falls between two of the reference standards, the number corresponding to the more yellow of the reference standards shall be assigned to the carcass.

If the colour matches that of one of the standards, the carcass is given the score of the matching standard.

Fat colour standards range – (0) to (9).

*[Image of fat colour reference standards]*

##### Marbling

Marbling is the intramuscular fat that is deposited between muscle fibres of the *M. longissimus dorsi* muscle.

Marbling is assessed on the chilled carcass and scored by comparing the proportion of marbled fat to meat at the surface of the assessment site which lies within the *M. longissimus dorsi* boundary.

Fat within the *M. longissimus dorsi* that is attached to the edge of the *M. longissimus dorsi* may be included as marbled fat from the point of intrusion at which it narrows to 1 mm in width, in an undisturbed state, for the first time.

Marbling is assessed and scored against marbling reference scores (see image below). The marbling scores can be used to assess

- (i) The amount of marbling: (0) to (9)
- (ii) The fineness and distribution of marbling (100) to (1,190) in increments of 10.

Both scores may be used together to provide more detail about the product.

Marbling scores may be used in the prediction of eating quality.

*[Image of marbling reference scores]*

### **Eye muscle area**

Eye muscle area (EMA) is the area of the surface of the *M. longissimus dorsi* at the ribbing site. Calculated in square centimetres, EMA may be measured at the 10th, 11th, 12th or 13th rib.

EMA can be measured manually or by using approved equipment.

When EMA is measured manually a plastic grid is used. The grid is placed over the *M. longissimus dorsi* and the number of square centimetres in the eye muscle boundary are counted. If any part of the centre dot of a grid square falls on or in the eye muscle boundary that square is counted. If a centre dot falls outside the eye muscle boundary the square is not counted.

The *M. longissimus dorsi* must be in situ and its shape must not be distorted.

EMA is not reported where carcasses have been assessed using the Spencer roll ribbing method.

### **Carcase maturity**

Carcase maturity is an assessment of the physiological development of a beef carcass determined by the degree of ossification of the dorsal spinous processes of the vertebrae, the fusing of vertebrae, and the shape and colour of the rib bones.

The score applied to each carcass should be that which most closely represents the descriptions provided in the carcass maturity chart.

The carcass maturity chart represents the ossification and rib characteristics of the average carcass. The rate of ossification of individual spinous processes varies between individual carcasses and therefore, in individual carcasses, not all areas of the spine may correlate with the chart. In these cases, the shaded area of the chart should be treated as the primary evaluation position. The most mature characteristic must be evaluated and is used to complete the maturity score.

Carcass maturity range 100 to 590

*[Image of carcass maturity chart]*

Carcass maturity scores may be used in the prediction of eating quality.

### **Subcutaneous rib fat**

Subcutaneous rib fat measurement is a measurement in millimetres (mm) of the thickness of subcutaneous fat at the assessment site. Subcutaneous rib fat is measured at a specific position on the 10th, 11th, 12th, or 13th rib. Where the rib site is damaged, the other side of the carcass may be measured. Where both sides of the carcass have a damaged rib fat site, an estimated depth may be applied.

*[Image of subcutaneous rib fat measurement]*

Subcutaneous rib fat measurement may be used in the prediction of eating quality.

### **Total rib fat**

Total rib fat measurement is a measurement in millimetres (mm) of the thickness of subcutaneous and intermuscular fat at the assessment site. Total rib fat is measured at a specific position on the 10th, 11th, 12th, or 13th rib. Where the rib site is damaged, the other side of the carcass may be measured. Where both sides of the carcass have a damaged rib fat site, an estimated depth may be applied.

*[Image of total rib fat measurement]*

### **Hump height**

Hump height is used to measure the greatest width of the hump muscle (*M. rhomboideus*). Research has shown a strong correlation between hump height and eating quality particularly for the predication of tropically adapted cattle and entire male cattle.



Hump height is measured using a metric ruler in gradients of 5 mm. The ruler is held horizontally to the surface of the sawn chine and parallel to the rib bones. The ruler is moved to the position of the greatest width of the hump and the measurement is taken by viewing from a site that eliminates parallax errors.

The measurement includes all the meat from the ligamentum nuchae (paddywack) and across to the most dorsal edge of the *M. rhomboideus* (hump) muscle. It does not include the subcutaneous fat on the lateral surface of the carcass.

The ligamentum nuchae and cervical vertebrae must remain in situ for hump height to be measured.

*[Image of hump height measurement]*

### **Ultimate pH measurement**

The ultimate pH (pHu) of meat will vary from carcass to carcass depending on the amount of glycogen in the live animal prior to slaughter. The ultimate pH is an important determinant of meat eating quality. Prior to carcasses being assessed they must have met their ultimate pH.

Ultimate pH must be measured using an approved device and must be undertaken with a calibrated pH meter and recorded in conjunction with temperature. The approved device must contain the Bendall correction factor for reporting pH.

Ultimate pH is measured in the *M. longissimus dorsi* (assessment site) at the quartered rib site, between the 5th and 13th ribs and is recorded to two decimal places with temperature recorded to one decimal place.

*[Image of ultimate pH measurement]*

The measurement of ultimate pH may be used in the prediction of eating quality.

## **5. Carcass assessor competence and eligibility**

### **Competence**

Each assessor must hold the appropriate knowledge and skills to perform the duties of a carcass assessor.

### **Maintaining eligibility**

To ensure that meat quality assessment standards are accurately and consistently applied it is necessary for carcass assessors to meet the ongoing minimum accuracy standards to maintain their eligibility to collect carcass meat quality information.

In order to maintain currency as a carcass assessor, assessors are required to conduct successful correlations on an (8) eight weekly cycle meeting the minimum accuracy standards for eligibility.

### **Assessor vision standards**

Assessors must meet the following vision standard criteria

- (i) Be able to determine colour in the red and yellow spectrums
- (ii) Must have visual acuity at distances from 300 mm to 1,200 mm
- (iii) Must be able to provide evidence of their ability to comply with the above vision standards.

## **6. Feedback and labelling standards**

Assessment attribute statements are used to describe meat quality attributes relating to carcass assessment. The use of an assessment attribute statement may be incorporated into feedback and trade description labels after carcass assessment has been performed.

Feedback is defined as the detailed quality information provided at the completion of carcass assessment. Feedback may be used within the livestock and meat supply chains to benchmark carcass performance.

Where quality assessments are used to provide carcass information through feedback sheets, and as part of the trade description on product labels, there are minimum requirements for the use of symbols and the order on the labelling (see below).

Inclusion of assessment attribute statements is optional on both feedback sheets and trade description labels.

### Application of symbols

When used in feedback sheets and on trade description labels the following symbols must be used if the product is described using bovine carcass assessment language and must be in the following order:

<i>Assessment attribute</i>	<i>Symbol</i>
Marbling (amount)	MB
Marbling (fineness)	ECEMB
Meat colour	MC
Veal colour	VC
Fat colour	FC
Maturity	OM
Subcutaneous rib fat	RF
Total rib fat	TRF
Eye muscle area	EMA
Ultimate pH	pHU

### Additional labelling information

Marbling (MB) – may be shown as an individual score or ranges or as a minimum score only (e.g. MB: 2, MB: 2up, MB: 9+).

Beef Meat Colour (MC) – can be shown as individual scores or ranges.

Veal Meat Colour (VC) – can be shown as individual scores or ranges.

Fat Colour (FC) – can be shown as individual scores or ranges.

A colon (:) should follow the symbols e.g. MB: 1-4 MC: 1B-4 FC: 1-3.