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►**B**

COMMISSION DECISION

of 11 March 2005

authorising methods for grading pig carcases in Poland

(notified under document number C(2005) 552)

(Only the Polish text is authentic)

(2005/240/EC)

(OJ L 74, 19.3.2005, p. 62)

Amended by:

		Official Journal		
		No	page	date
►**M1**	Commission Decision 2005/609/EC of 8 August 2005	L 207	20	10.8.2005
►**M2**	Commission Decision 2005/683/EC of 30 September 2005	L 258	5	4.10.2005
►**M3**	Commission Implementing Decision 2011/506/EU of 16 August 2011	L 209	43	17.8.2011
►**M4**	Commission Implementing Decision (EU) 2019/252 of 11 February 2019	L 42	29	13.2.2019

▼B

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▼M4

Article 1

The use of the following methods is authorised for grading pig carcasses pursuant to point 1 of Section B.IV of Annex IV to Regulation (EU) No 1308/2013 of the European Parliament and of the Council [1] in Poland:

(a) the 'Capteur Gras/Maigre — Sydel (CGM)' apparatus and the assessment methods related thereto, details of which are given in Part 1 of the Annex;

(b) the 'Ultra FOM 300' apparatus and the assessment methods related thereto, details of which are given in Part 2 of the Annex;

(c) the 'Fully automatic ultrasonic carcass grading (Autofom)' apparatus and the assessment methods related thereto, details of which are given in Part 3 of the Annex;

(d) the 'IM-03' apparatus and the assessment methods related thereto, details of which are given in Part 4 of the Annex;

(e) the 'Autofom III' apparatus and the assessment methods related thereto, details of which are given in Part 5 of the Annex;

(f) the 'CSB Image-Meater (CSB)' apparatus and the assessment methods related thereto, details of which are given in Part 6 of the Annex;

(g) the 'Fat-O-Meater II (FOM II)' apparatus and the assessment methods related thereto, details of which are given in Part 7 of the Annex;

(h) the 'manual method (ZP)' and the assessment methods related thereto, details of which are given in Part 8 of the Annex;

(i) the 'gmSCAN' apparatus and the assessment methods related thereto, details of which are given in Part 9 of the Annex;

(j) the 'ESTIMEAT' apparatus and the assessment methods related thereto, details of which are given in Part 10 of the Annex;

(k) the 'MEAT3D' apparatus and the assessment methods related thereto, details of which are given in Part 11 of the Annex.

As regards the apparatus 'Ultra FOM 300', referred to in point (b) of the first subparagraph, after the end of the measurement procedure it must be possible to verify on the carcass that the apparatus measured the values of measurement F1 and F2 on the site provided for in the Annex, Part 2, point 3. The corresponding marking of the measurement site must be made at the same time as the measurement procedure.

[1] Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007 (OJ L 347, 20.12.2013, p. 671).

▼**M4**

The manual method ZP, referred to in point (h) of the first subparagraph, shall only be authorised for abattoirs having a slaughter line with a capacity to process no more than 40 pigs per hour.

Article 2

Notwithstanding the standard presentation referred to Section B.III of Annex IV to Regulation (EU) No 1308/2013, the flare fat, the kidneys and the diaphragm need not be removed from pig carcasses before being weighed and graded whereas the external auditory canal may be removed. In order to establish quotations for pig carcasses on a comparable basis, the recorded hot weight shall be:

(a) reduced:

(1) for diaphragm by 0,23 %;

(2) for flare fat and kidneys by:

— 1,90 % for carcasses grade S and E,

— 2,11 % for carcasses grade U,

— 2,54 % for carcasses grade R,

— 3,12 % for carcasses grade O,

— 3,35 % for carcasses grade P;

(b) increased by 260 grams per carcass for both external auditory canals.

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Article 3

Modifications of the apparata or the assessment methods shall not be authorised.

Article 4

This Decision is addressed to the Republic of Poland.

▼M3

ANNEX

METHODS FOR GRADING PIG CARCASSES IN POLAND

Part 1

CAPTEUR GRAS/MAIGRE — SYDEL (CGM)

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'Capteur Gras/ Maigre — Sydel (CGM)'.

2. The apparatus shall be equipped with a high-definition Sydel probe 8 mm in width, a light-emitting infra-red diode (Honeywell) and two light sensors (Honeywell). The operating distance is between 0 and 105 mm. The values measured will be converted into estimated lean meat content by the CGM itself.

3. The lean meat content of the carcass shall be calculated according to the following formula:

$$\hat{Y} = 59{,}42 + 0{,}1322 \times M_2 - 0{,}6275 \times F_2$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

M_2 = the thickness of the dorsal muscle in millimetres, measured at the third to fourth last rib position, 6 centimetres from the dorsal midline, measured parallel to the split line of the carcass,

F_2 = the thickness of back-fat (including rind) in millimetres measured at the same time, in the same place and in the same way as M2.

This formula shall be valid for carcasses weighing between 60 and 120 kilograms.

Part 2

ULTRA FOM 300

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'Ultra FOM 300'.

2. The apparatus shall be equipped with an ultrasonic transducer array at 3,5 MHz (U-Systems). The results of the measurements shall be converted into estimated lean meat content by means of the Ultra FOM apparatus itself.

3. The lean meat content of the carcass shall be calculated according to the following formula:

$$\hat{Y} = 54{,}48 + 0{,}1272 \times M_1 - 0{,}3090 \times F_1 + 0{,}0828 \times M_2 - 0{,}2802 \times F_2$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

M_1 = the thickness of the dorsal muscle in millimetres, measured at the last rib position, 7 centimetres from the dorsal midline perpendicularly to the muscle,

▼M3

M_2 = the thickness of the dorsal muscle in millimetres, measured at the third to fourth rib from the last rib position, 7 centimetres from the dorsal midline perpendicularly to the muscle,

F_1 = the thickness of back-fat (including rind) in millimetres measured at the same time, in the same place and in the same way as M_1,

F_2 = the thickness of back-fat (including rind) in millimetres measured at the same time, in the same place and in the same way as M_2,

This formula shall be valid for carcasses weighing between 60 and 120 kilograms.

Part 3

FULLY AUTOMATIC ULTRASONIC CARCASS GRADING (AUTOFOM)

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'Autofom (Fully automatic ultrasonic carcass grading)'.

2. The apparatus shall be equipped with 16 ultrasonic transducers at 2 MHz (GE Inspection Technologies). The ultrasonic data shall comprise measurements of back-fat thickness and muscle thickness. The results of the measurements are converted into estimated lean meat content using a computer.

3. The lean meat content of the carcass shall be calculated according to the following formula:

$$\hat{Y} = 62{,}9442 + (AF1_IP005 \times -0{,}018154) + (AF1_IP006 \times -0{,}027186) + (AF1_IP008 \times -0{,}047431) + (AF1_IP022 \times -0{,}011910) + (AF1_IP023 \times -0{,}071926) + (AF1_IP024 \times 0{,}005814) + (AF1_IP034 \times 0{,}029288) + (AF1_IP036 \times 0{,}005096) + (AF1_IP038 \times 0{,}010231) + (AF1_IP039 \times 0{,}012659) + (AF1_IP041 \times 0{,}022470) + (AF1_IP047 \times -0{,}007939) + (AF1_IP049 \times -0{,}075061) + (AF1_IP050 \times -0{,}028977) + (AF1_IP052 \times -0{,}091722) + (AF1_IP055 \times -0{,}060411) + (AF1_IP058 \times -0{,}098989) + (AF1_IP060 \times -0{,}064891) + (AF1_IP061 \times -0{,}065688) + (AF1_IP063 \times -0{,}064035) + (AF1_IP074 \times -0{,}078333) + (AF1_IP078 \times -0{,}078486) + (AF1_IP079 \times -0{,}035330) + (AF1_IP081 \times -0{,}048421) + (AF1_IP091 \times -0{,}107559) + (AF1_IP094 \times 0{,}008816) + (AF1_IP096 \times 0{,}000797) + (AF1_IP098 \times 0{,}014608) + (AF1_IP103 \times 0{,}007774) + (AF1_IP104 \times 0{,}008251) + (AF1_IP122 \times 0{,}012957)$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

AF1_IP005, AF1_IP006, AF1_IP008 … AF1_IP122 are the variables measured by Autofom.

4. The measuring points and the statistical method are described in Part II of the protocol presented to the Commission by Poland in accordance with Article 23(4) of Commission Regulation (EC) No 1249/2008 ([1]).

This formula shall be valid for carcasses weighing between 60 and 120 kg.

([1]) OJ L 337, 16.12.2008, p. 3.

▼M3

Part 4

IM-03

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'IM-03'.

2. The apparatus shall be equipped with a needle-optical probe (single line scanner SLS01) of 7 millimetres diameter. The probe contains the line of contact image sensors (CIS) and green light-emitting diodes. The operating distance is between 0 and 132 millimetres.

3. The lean meat content of the carcass shall be calculated according to the following formula:

$$\hat{Y} = 60{,}55 + 0{,}1142 \times M_2 - 0{,}6292 \times F_2$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

M_2 = the thickness of the dorsal muscle in millimetres, measured at the third to fourth last rib position, 6 centimetres from the dorsal midline, measured parallel to the split line of the carcass,

F_2 = the thickness of back-fat (including rind) in millimetres measured at the same time, in the same place and in the same way as M_2.

This formula shall be valid for carcasses weighing between 60 and 120 kilograms.

Part 5

AUTOFOM III

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'Autofom III'.

2. The apparatus shall be equipped with 16 2 MHz ultrasonic transducers (Carometec A/S), with an operating distance between transducers of 25 mm. The ultrasonic data shall comprise measurements of back-fat thickness, muscle thickness and related parameters. The results of the measurements shall be converted into estimates of the percentage of lean meat by using a computer.

3. The lean meat content of carcasses shall be calculated on the basis of 10 variables according to the following formula:

$$\hat{Y} = 73{,}8876 + (AF3_R2P1 \times -1{,}036616) + (AF3_R2P3 \times -0{,}180173) + (AF3_R2P13 \times -0{,}144679) + (AF3_R2P15 \times -0{,}221519) + (AF3_R3P5 \times 0{,}136061) + (AF3_R4P4 \times 0{,}249888) + (AF3_R4P5 \times 0{,}330109) + (AF3_R4P6 \times 0{,}184696) + (AF3_R4P8 \times -0{,}112875) + (AF3_R4P9 \times -0{,}113663)$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

R2P1, R2P3, R2P13 … R4P9 — are the variables measured by Autofom III.

▼M3

4. The measuring points are described in Part II of the protocol presented to the Commission by Poland in accordance with Article 23(4) of Regulation (EC) No 1249/2008.

This formula shall be valid for carcasses weighing between 60 and 120 kg.

Part 6

CSB IMAGE-MEATER (CSB)

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'CSB Image-Meater'.

2. The CSB Image-Meater consists in particular of a video camera, a PC equipped with an image-analysis card, a screen, a printer, a command mechanism, a trigger mechanism and interfaces. The 5 Image-Meater variables are all measured at the split line in the ham area (around *M. gluteus medius*).

The results of the measurements shall be converted into estimates of the percentage of lean meat by using a computer.

3. The lean meat content of carcases shall be calculated according to the following formula:

$$\hat{Y} = 54{,}0770376148 - (0{,}4460170496 \times MS) + (0{,}1046346719 \times MF) - (0{,}0575429366 \times VaF) + (0{,}2303135777 \times VcF) - (0{,}1637971133 \times VdF)$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

MS — mean averaged fat depth over *M. gluteus medius* (mm),

MF — mean averaged muscle depth of the muscles lumbar and *M. gluteus medius* (mm),

VaF, VcF, VdF — mean averaged muscle depth over the selected three lumbar vertebral bodies cranial (mm).

4. The measuring points are described in Part II of the protocol presented to the Commission by Poland in accordance with Article 23(4) of Regulation (EC) No 1249/2008.

This formula shall be valid for carcasses weighing between 60 and 120 kg.

Part 7

FAT-O-MEATER II (FOM II)

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'Fat-O-Meater II'.

2. The apparatus is a new version of the Fat-O-Meater measurement system. The FOM II consists of an optical probe with a knife, a depth measurement device having a measurement depth of 125 mm and a data acquisition and analysis board – Carometec Touch Panel i15 computer (Ingress Protection IP69K).

All legally relevant acquisition and analysis are contained within the FOM II pistol. The terminal is part of the FOM II and fully integrated with it.

The results of the measurements are converted into estimated lean meat content by means of a computer.

▼M3

3. The lean meat content of carcasses shall be calculated according to the following formula:

$$\hat{Y} = 59{,}75 + 0{,}1533 \times M_2 - 0{,}6342 \times F_2$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

M_2 = the thickness of the dorsal muscle in millimetres, measured at the third to fourth last rib position, 7 centimetres from the dorsal midline, measured perpendicularly to the muscle,

F_2 = the thickness of back-fat (including rind) in millimetres measured at the same time, in the same place and in the same way as M_2.

This formula shall be valid for carcasses weighing between 60 and 120 kilograms.

Part 8

MANUAL METHOD (ZP)

1. The rules provided for in this Part shall apply when the grading of pig carcasses is carried out by use of the 'manual method (ZP)' measuring by ruler.

2. This method may be implemented using a ruler, with the grading determined on the basis of the prediction equation. It is based on the manual measurement on the midline of the split carcass of the thickness of the fat and of the thickness of the muscle.

3. The lean meat content of carcasses shall be calculated according to the following formula:

$$\hat{Y} = 52{,}61 - 0{,}6148 \times F + 0{,}1842 \times M$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in the carcass,

F = the minimum thickness of visible fat on the midline of the split carcass in millimetres, covering the *M. gluteus medius* (mm),

M = the visible thickness of the lumbar muscle on the midline of the split carcass, measured as the shortest connection between the front (cranial) end of the *M. gluteus medius* and the upper (dorsal) edge of the vertebral canal (mm).

This formula shall be valid for carcasses weighing between 60 and 120 kilograms.

▼M4

Part 9

gmSCAN

1. The rules provided for in this part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'gmSCAN'.

2. The gmSCAN uses magnetic induction to determine the dielectric properties of the carcasses without contact. The measurement system is formed by a number of transmitter coils that generate a variable and low intensity magnetic field. The receiver coils convert the signal from the perturbation of magnetic field caused by the carcass into a complex electric signal, related to the dielectric parameters of the muscle and fat tissue of the carcass.

▼M4

3. The lean meat content of a carcass shall be calculated according to the following formula:

$$\hat{Y} = 44{,}589 - 0{,}190 \times CW + 2\,341{,}210 \times (Q1/CW) - 936{,}097 \times (Q2/CW) + 1\,495{,}516 \times (Q3/CW)$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in a carcass;

CW = warm carcass weight (in kilograms);

Q1, Q2 and Q3 = Magnetic Induction response (Volts) from the ham, middle and shoulder area, respectively.

This formula shall be valid for carcasses weighing between 60 and 120 kilograms (warm weight).

Part 10

ESTIMEAT

1. The rules provided for in this part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as 'ESTIMEAT'.

2. ESTIMEAT uses a depth camera to produce a three-dimensional picture of the carcass and to estimate carcass shape parameters. 130 cross sections are produced and for each cross section, the following parameters are determined in order to calculate the lean meat content: surface size, circuit, convexities.

3. The lean meat content of a carcass shall be calculated according to the following formula:

$$\hat{Y} = 38{,}39317497 + 508{,}24 \times X1 - 148{,}557 \times X2 - 3{,}63439 \times X3 + 2{,}481331 \times X4 + 8{,}353825 \times X5 + 2{,}75896 \times X6 + 268{,}8835 \times X7$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in a carcass;

X1 = summary error of fitting points of cross section to circle with R_{sf} radius at point P-66;

X2 = outside convexity of carcass between maximum convexity of ham and shoulder at point Z-80;

X3 = summary error of fitting points of cross section to circle with R radius at point P-58/summary error of fitting points of cross section to circle with R radius at point P-67;

X4 = summary error of fitting points of cross section to circle with R_{sf} radius at point P-103/summary error of fitting points of cross section to circle with R_{sf} radius at point P-111;

X5 = cross section partial depth at point P-49 in 3/10 of the section width/cross section partial depth at point P-49 in 5/10 of the section width;

X6 = cross section maximum depth at point P-18/cross section maximum depth at point P-49;

X7 = partial error in points of cross section to circle with R radius at point P-72 in the 4/10 of the cross sectional area.

This formula shall be valid for carcasses weighing between 60 and 120 kilograms (warm weight).

▼M4

Part 11

MEAT3D

1. The rules provided for in this part shall apply when the grading of pig carcasses is carried out by means of the apparatus known as ‘MEAT3D’.

2. MEAT3D uses a scanner to produce a three-dimensional image of the carcass and to estimate carcass shape parameters. A specific frame is used for positioning the half carcass of pig during the scanning process. 130 cross sections are produced and for each cross section, the following parameters are determined in order to calculate the lean meat content: surface size, circuit, convexities.

3. The lean meat content of a carcass shall be calculated according to the following formula:

$$\hat{Y} = 50{,}36925112 + 0{,}543385 \times X1 - 9{,}06185 \times X2 - 10{,}83 \times X3 + 488{,}8033 \times X4 - 2{,}56922 \times X5 + 17{,}34226 \times X6 - 2{,}00088 \times X7$$

where:

$\hat{Y}$ = the estimated percentage of lean meat in a carcass;

X1 = summary error of fitting points of cross section to circle with R_{sf} radius at point P-49/summary error of fitting points of cross section to circle with R_{sf} radius at point P-23;

X2 = summary error of fitting points of cross section to circle with R radius at point P-79/maximum value of carcass convexities in locations P_50 –P99;

X3 = the radius of curvature of cross section at point P-68/the radius of curvature of cross section at point P-51;

X4 = partial error in points of cross section to circle with R radius at point P-70 in the 3/10 of the cross sectional area;

X5 = summary error of fitting points of cross section to circle with R_{sf} radius at point P-55/summary error of fitting points of cross section to circle with R_{sf} radius at point P-71;

X6 = cross section partial depth at point P-62 in 3/10 of the section width/cross section partial depth at point P-62 in 6/10 of the section width;

X7 = cross section partial depth at point P-33 in 2/10 of the section width/maximum value of ham.

This formula shall be valid for carcasses weighing between 60 and 120 kilograms (warm weight).