
Operating procedures of pig slaughtering

Modes opératoires d'abattage des porcs

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 6, *Meat, poultry, fish, eggs and their products*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Operating procedures of pig slaughtering

1 Scope

This document specifies pre-slaughter requirements, operating procedures and requirements of pig slaughtering, storage and other requirements.

This document is applicable to the slaughtering operation of pigs. For some categories of pigs (e.g. piglets, breeding pigs), other operating procedures can be applied.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CAC/RCP 58-2005, *Code of Hygienic Practice for Meat*

CXC 1-1969, *General Principles of Food Hygiene*

World Organization for Animal Health, Terrestrial Animal Health Code (OIE TAHC), 2021

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

pig body

remaining body after the pig is stunned and bled

3.2

inspection

<animal slaughter and processing> ante-mortem and post-mortem inspection procedures to manage risks to animal health, animal welfare and public health

3.3

half-carcass pork

pork with or without skin produced by longitudinally sawing (splitting) the pig carcass along the middle line of the spine into two halves

4 Pre-slaughter requirements

4.1 Whenever possible, slaughterhouses should conduct a gap analysis and develop an animal welfare plan for all the operating procedures of pig slaughtering in accordance with ISO/TS 34700:2016, which can facilitate the implementation of any public or private sector animal welfare standards that meet at least the requirements of OIE TAHC.

4.2 Only healthy, clean and appropriately identified pigs shall be presented for slaughter. Special attention should be paid when dealing with delays in unloading the pigs. For each batch of pigs, the slaughterhouse should collect and record the information identifying the breeding farm of origin.

4.3 Animal welfare during pre-slaughter operations shall meet the requirements of animal slaughtering in Chapter 7.1 "Introduction to the recommendations for animal welfare" and Chapter 7.5 "Slaughter of animals" of OIE TAHC, 2021.

4.4 The pigs which are ready for slaughtering shall be allowed to rest. Drinking water should always be available in the lairage area.

4.5 Ante-mortem inspection shall be conducted in accordance with CAC/RCP 58-2005. The pigs that can be sent for slaughtering shall have successfully passed the inspection.

4.6 When passing through the slaughtering raceways, the pigs shall be driven in order, but shall never be forced.

4.7 The body surface of pigs shall be visibly clean of, for example, excessive faeces and dirt. The showering of dirty pigs before stunning is recommended.

5 Operating procedures and requirements of slaughtering

5.1 Restraint

Restraint should facilitate the correct application of the stunning method or bleeding equipment.

5.2 Stunning

5.2.1 Stunning methods

Electrical stunning, gas stunning or captive bolt stunning shall be applied to stun the pigs.

- a) Electrical stunning: Manual or automatic electrical current to the head, or to the head and the heart, shall be applied to stun the pigs.
- b) Gas stunning: The pigs shall be driven into a chamber, tunnel or pit filled with either carbon dioxide, inert gasses (such as argon or nitrogen), or a mixture of carbon dioxide and inert gasses for stunning.
- c) Captive bolt stunning: Place the muzzle at right angles to the front of the animal's head, and then press the firing pin.

5.2.2 Requirements for effective stunning

5.2.2.1 After stunning, the pigs shall be unconscious, and remain unconscious until death has been confirmed by bleeding. The pigs shall not be repeatedly stunned. Unconsciousness should be monitored at different stages: immediately after stunning, just before neck cutting, and during bleed-out.

5.2.2.2 In the case of ineffective stunning or recovery, pigs shall be re-stunned immediately using a backup system.

5.2.2.3 No pigs shall be processed while they are still conscious or have the potential to recover consciousness.

5.3 Bleeding

5.3.1 After stunning, the pigs shall be immediately bled. For electrical stunning, the duration from stunning to bleeding should not exceed 30 s. When head-only electrical stunning is used, the duration should be less than 15 s. This recommendation is not necessary for high-concentration gas stunning which permits a long anaesthesia period.

5.3.2 Point the knife tip to about 0,5 cm to 1 cm to the right of the centre of the throat, and stab in the direction of the heart. Then make a cross cut and keep moving the knife to cut the carotid artery and jugular veins. The heart shall not be pierced, and the oesophagus and trachea shall not be cut off. The length of the cut should be about 5 cm. The duration of bleeding shall be no less than 3 min. During the bleeding process, the pigs shall not choke on blood or have congestion.

5.3.3 The duration from bleeding to offal removal should not exceed 30 min. The duration from bleeding to pre-chilling should not exceed 45 min.

5.4 Scalding and dehairing

5.4.1 Either steam or hot water shall be applied for scalding. The scalding temperature and time shall be adjusted according to the size and breed of the pigs and the season. The scalding methods are as follows.

- a) Steam scalding. The temperature in the steam scalding tunnel should be adjusted to 59 °C to 62 °C and the time should be adjusted to 6 min to 8 min.
- b) Hot water scalding. The water temperature of the scalding tank should be adjusted to 58 °C to 63 °C and the time should be adjusted to 3 min to 6 min. There shall be an opening for overflowing and a device for replenishing clean water. The water in the scalding tank shall be replaced every day based on the hygiene status. During the scalding process, the pig body shall not sink to the bottom. Over-scalding and under-scalding shall be avoided.

5.4.2 Dehairing equipment shall be applied for dehairing. The pig body may have minimal hair but should not have mechanical damage and peeled skin after dehairing.

5.5 Hanging

5.5.1 Both hind legs of the pigs shall be lifted and a pierce shall be made distal to the hock without cutting off the ligament which connects the hock and shin bones. The length of the cut can be 5 cm to 6 cm.

5.5.2 After both hind legs are hooked, the pig body shall be lifted and transported to the carcass processing line.

5.6 Pre-drying

The remaining hair attached to the body surface, which has been otherwise plucked during the dehairing process, and the water on the pig body should be removed by brushing or by using pre-drying equipment.

5.7 Singeing

Either a blow torch or singeing equipment shall be applied to remove the remaining hair on the pig body.

5.8 Cleaning and polishing

The remaining hair, nails and ash shall be removed manually or by using polishing equipment. The pig body shall be cleaned using water.

5.9 Bunging

The knife shall pierce the surrounding area of the anus and make a circular cut around it. The end of the rectum should be bagged or tied off and vertically placed into the pelvis. Bunging can also be done by aiming and inserting the bunging equipment tip into the anus, then activating the equipment to cut off the rectum from the pig body with its circular blades. The surrounding area of the anus shall have as little meat as possible. The end of the rectum shall be separated from the sphincter. The rectum shall not be cut during this process.

5.10 Eviscerating

5.10.1 Opening the abdominal and thoracic cavities: A longitudinal incision shall be made from the pubis to the neck to open the abdominal and thoracic cavities. During this process, the male reproductive organs shall be removed. The offal shall not be pierced.

5.10.2 Tearing off the rectum and bladder: This process shall be done by grabbing the rectum and cutting off the mesentery and ligament. Then the bladder and female reproductive organs should be torn off without piercing the rectum.

5.10.3 Removing the intestines and stomach: This process shall be done by grabbing the mesentery and the greater curvature of the stomach, then cutting off the mesenteric tissue, intestines and stomach at a location which is close to the kidneys. The oesophagus and its associated connective tissue shall also be cut off. The removed offal shall be put into a container or in/on any kind of support for inspection. During this process, the intestines and stomach shall not be pierced.

5.10.4 Removing the heart, liver and lungs: This process shall be done by grabbing the liver and cutting the diaphragm on both sides. Then any connective tissue that connects the thoracic cavity and the neck shall be cut off to remove the oesophagus, trachea, heart, liver and lungs. The removed offal shall be put into a container or in/on any kind of support for inspection. During this process, the offal shall not be damaged. The thyroid gland shall be removed.

5.10.5 Washing the abdominal and thoracic cavities: The abdominal and thoracic cavities may be washed immediately after removing the offal. Any blood clots, attached hair and other contaminant should be cleaned. The carcass surface which is contaminated by the contents of pierced offal shall be trimmed and discarded.

5.10.6 Removing the tail: The tail may be removed at any point of the evisceration or during the cutting process.

5.11 Splitting

The carcass shall be split into two parts along the middle line of the spine. The leaf fat and kidneys shall be removed from the half-carcass pork after the splitting process. Any blood stains and attached hair shall be removed.

5.12 Head and feet removal

5.12.1 Head removal

The head shall be removed by using a head cutter or a knife to separate the skull from the cervical vertebra at the foramen magnum. The head may be removed during the slaughtering or carcass fabrication process.

5.12.2 Feet removal

The fore feet shall be removed at the wrist joint and the hind feet shall be removed through the hock joint. The cross-section of cut shall be neat. The feet may be removed during the slaughtering or carcass fabrication process.

5.13 Trimming

5.13.1 The carcass should be trimmed free of all visible contamination and defects. The adrenal glands and remaining thyroid gland shall be removed.

5.13.2 The heart, liver, lungs, spleen, stomach, intestine, pancreas and other offal shall be separated and sorted as required.

5.13.3 The offal shall not touch the ground during the handling process.

5.14 Inspection

The inspection shall be conducted in accordance with CAC/RCP 58-2005.

5.15 Chilling

The carcass should be transported to a cooling room for chilling. The core temperature of the hind leg shall reach below 7 °C and the core temperature of the offal shall reach below 3 °C within 24 h.

5.16 Freezing

The temperature inside the freezing room shall remain below –28 °C. The temperature of the frozen product should reach a temperature lower than –18 °C. After the core temperature reaches below –15 °C, the products shall be transported to a cold storage room.

6 Storage

6.1 The cold storage room shall have temperature monitoring devices. Regular checks and records shall be made and maintained. A pest control programme shall be developed and implemented in accordance with CXC 1-1969.

6.2 The chilled half-carcass pork shall be stored in a cold storage room with a temperature of 0 °C to 4 °C. The half-carcass pork shall be hung with a space no less than 3 cm between each other. The frozen half-carcass pork shall be stored in a cold storage room with a temperature of below –18 °C. The daily temperature fluctuation of the cold room should be no more than ±1 °C.

7 Other requirements

7.1 The knives used for bleeding, head removal, bunning, eviscerating and other processes shall be sanitized with hot water for each pig. The temperature of the hot water shall remain no lower than 82 °C.