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EAST AFRICAN STANDARD

Guidelines for handling, storage and transport of slaughter-house by-products

EAST AFRICAN COMMUNITY

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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Introduction

There is a great potential for utilization of slaughter-house byproducts for valuable pharmaceutical products, if these can be handled, stored and transported under appropriate conditions. This standard is intended to provide guidelines for such conditions, thereby saving sizeable quantities of this raw material for the pharmaceutical industries.

In the preparation of this East African Standard, the following sources were consulted extensively:

IS 8895:1978(R2000), *Guidelines for Handling, Storage and Transport of Slaughter-House By-Products*

Codex Alimentarius website: http://www.codexalimentarius.net/mrls/pestdes/jsp/pest_q-e.jsp

USDA Foreign Agricultural Service website: <http://www.mrlatabase.com>

USDA Agricultural Marketing Service website: <http://www.ams.usda.gov/AMSv1.0/Standards>

USDA Plant Inspectorate Service website: http://www.aphis.usda.gov/import_export/plants

European Union: http://ec.europa.eu/sanco_pesticides/public

Assistance derived from these sources is hereby acknowledged.

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Guidelines for handling, storage and transport of slaughter-house by-products

1 Scope

1.1 This standard provides guidelines for proper handling, storage and transport of by-products of slaughter-houses and meat processing factories.

1.2 This standard does not include the guidelines for the processing of pharmaceutical products like insulin and pancreatin.

2 Normative references

The following referenced documents are indispensable for the application 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.

AOAC Official Method 931.06:1931, *Phosphorus (Total) (P_2O_5) in Eggs*

CAC/RCP 1, *Recommended international code of practice — General principles of food hygiene*

CD-K-670:2010, *Bovine (beef) meat — Carcasses and cuts*

CD-K-671:2010, *Caprine (goat) meat — Carcasses and cuts*

CD-K-672:2010, *Ovine (sheep) meat — Carcasses and cuts*

CD-K-673:2010, *Porcine (pig) meat — Carcasses and cuts*

CD-K-692:2010, *Mutton and goat meat canned in brine — Specification*

CD-K-675:2010, *Edible meat co-products*

CD-K-693:2010, *Animal casings — Specification*

CD-K-697:2010, *Code of hygienic practice for meat*

CD-K-699:2010, *Veterinary drugs residues in foods — Maximum residue limits*

CD/K/700:2010, *Ante-mortem and post-mortem inspection of meat animals — Code of practice*

EAS 12, *Drinking (potable water) — Specification*

EAS 35, *Edible salt — Specification*

EAS 38, *Labelling of prepackaged foods — Specification*

EAS 39, *Hygiene in the food and drink manufacturing industry — Code of practice*

EAS 41, *Fruits, vegetables and derived products — Sampling and methods of test*

EAS 103, *Schedule for permitted food additives*

EAS 123, *Distilled water — Specification*

ISO 936, *Meat and meat products — Determination of total ash*

- ISO 937, *Meat and meat products — Determination of nitrogen content (Reference method)*
- ISO 1442, *Meat and meat products — Determination of moisture content (Reference method)*
- ISO 1443, *Meat and meat products — Determination of total fat content*
- ISO 1444, *Meat and meat products — Determination of free fat content*
- ISO 1736, *Dried milk and dried milk products — Determination of fat content — Gravimetric method (Reference method)*
- ISO 1737, *Evaporated milk and sweetened condensed milk — Determination of fat content — Gravimetric method (Reference method)*
- ISO 1841-1, *Meat and meat products — Determination of chloride content — Part 1: Volhard method*
- ISO 1841-2, *Meat and meat products — Determination of chloride content — Part 2: Potentiometric method*
- ISO 2294, *Meat and meat products — Determination of total phosphorus content (Reference method)*
- ISO 2917, *Meat and meat products — Measurement of pH — Reference method*
- ISO 2918, *Meat and meat products — Determination of nitrite content (Reference method)*
- ISO 3091, *Meat and meat products — Determination of nitrate content (Reference method)*
- ISO 3496, *Meat and meat products — Determination of hydroxyproline content*
- ISO 4134, *Meat and meat products — Determination of L-(+)- glutamic acid content — Reference method*
- ISO 4831, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms — Most probable number technique*
- ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*
- ISO 4833, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of microorganisms — Colony-count technique at 30 degrees C*
- ISO 5553, *Meat and meat products — Detection of polyphosphates*
- ISO 5554, *Meat products — Determination of starch content (Reference method)*
- ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*
- ISO 6491, *Animal feeding stuffs — Determination of phosphorus content — Spectrometric method*
- ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp.*
- ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*
- ISO 13493, *Meat and meat products — Determination of chloramphenicol content — Method using liquid chromatography*

ISO 13496, *Meat and meat products — Detection of colouring agents — Method using thin-layer chromatography*

ISO 13730, *Meat and meat products — Determination of total phosphorus content — Spectrometric method*

ISO 13965, *Meat and meat products — Determination of starch and glucose contents — Enzymatic method*

ISO 21527-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 1: Colony count technique in products with water activity greater than 0.95*

ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0.95*

3 Definitions

For the purpose of this standard the following definitions in addition to those given in CD-K-703:2010 shall apply:

3.1

Slaughter-House

the building, the premises or place which is licensed as a slaughter-house by the local authority for the slaughter of animals intended for human consumption

3.2

By-Products

Slaughter-house wastes in the form of parts cut off as waste from carcasses especially edible or inedible offals, blood, etc, which are not normally intended to be utilized for human consumption.

4 Ante-mortem and post-mortem inspection

The by-products shall be obtained from animals subjected to proper ante-mortem and post-mortem inspection as per CD/K/700:2010.

5 Handling, storage and transport

Various by-products shall be handled and stored under conditions as recommended in Table 1.

Table 1 — Requirements for handling, storage and transport of slaughter-house by-products

S/No.	Name of by-products	Utilization	Handling, storage and transport
(1)	(2)	(3)	(4)
(i)	Blood	Human food and pharmaceuticals, such as plasma, albumin and fibrin	In case of utilization as human food slaughter should preferably be done on bleeding rails and the blood should be collected in clean receptacles. Where blood plasma is required, collection should be done in an anticoagulant immediately after slaughter of animals. Where fibrin is required, the blood should be stored at chilling temperatures (4 to 7 °C) in a stainless steel container
		Livestock feed	In case of utilization for livestock feed, the blood should be collected in storage bins under conditions that prevent soiling with

S/No.	Name of by-products	Utilization	Handling, storage and transport
(1)	(2)	(3)	(4)
			any extraneous materials. The bins should then be covered and transported immediately to (within 3-6 hours) processing units. Lime or any other permitted preservative may be added at the time of collection
		Fertilizer and other commercial uses	Blood for processing into fertilizer may be collected by any of the above procedures and blood that has been soiled by regurgitated ingesta, floor and spilt blood may also be collected. Blood collected for food, pharmaceuticals or livestock feed if found unsuitable for any reason may also be included for processing into fertilizer stock. Blood should be collected and transported within 4-6 hours to the processing unit in closed containers. Addition of preservatives such as formalin or lysol may be done but these should be added only at locations where their use is permitted in the slaughterhouse premises. For prolonged storage of blood, it should be stored at 4 to 10 °C
(ii)	Pancreas	Trypsin, insulin, pancreatin and chymotrypsin	Pancreas should be removed expeditiously, preferably within 30 minute after slaughter of the animal to prevent autolysis. The glands should be collected into a stainless steel or aluminium vessel and chilled (4 °C) or frozen immediately. Direct contact of ice or freezing mixtures with the tissues should be avoided. After the tissue is chilled or frozen, it should be packaged in strong fibre boxes lined with thermocole or several layers of wax paper to protect the glands from thawing. Each container should be tightly filled to the top to give minimum air space. The glands shall be transported and stored under refrigerated conditions
(iii)	Endocrine glands	Hormones like pituitrin, thyroxine and adrenalin	The endocrine glands should be collected immediately after slaughter and preserved under frozen conditions, similar to the pancreas
(iv)	Liver	Liver extract, glycogen, vitamin B ₁₂ , etc	The livers should be removed without soiling and collected into stainless steel or aluminium containers provided with lids. These should be transported within 1 to 2 hours to processing unit and stored at cold storage temperature (4 °C)
(v)	Intestines	Casings, surgical sutures, etc	Primary cleaning which involve separation of intestines from mesentery and, removal of intestinal contents should be done in the slaughter-house. Further cleaning should be done within 1 to 2 hours at the processing unit. These should be transported to the place of processing preferably in any closed container like rust-free tins, polyethylene containers, or bags or closely woven baskets

S/No.	Name of by-products	Utilization	Handling, storage and transport
(1)	(2)	(3)	(4)
(vi)	Bile secretions	Bile salts	The galls bladder should be removed from the liver as soon as possible and the bile contents emptied immediately into a clean vessel through a fine screen to prevent any stones, parasites, etc, from passing through. Bile if stored for long periods should be preserved by addition of permitted anti-microbial agents depending on the end-product or frozen until use. Bile should be transported in closed containers preferably polyethylene or similar non-reactive materials and stored as above. Another method of preservation is by concentration of bile to change it to a syrup.
(vii)	Lungs	Heparin	Lungs are liable to rapid putrefaction. This should be prevented by addition of a suitable permitted anti-microbial agents. The tissue should then be stored for limited period at room temperature (25 to 35 °C)
(viii)	Testes	Hyaluronidase	The testes should be immediately collected in containers chilled in ice to protect the activity of hyaluronidase
(ix)	Trimblings and stomach	Proteose, peptone	The trimblings and stomach should, as far as possible, be collected from slaughter-house or meat processing factories immediately after the slaughtering and processing operations. Stomachs should be collected after emptying the ingesta in the offal washing area provided for the purpose, washed in water free of any adhering ingesta and transported at the earliest in closed containers to the processing units
(x)	Brain and spinal cord	Cholesterol	Same as for lungs
(xi)	Pig stomachs	Renin and pepsin	The pig stomach lining should be peeled off, cut into four pieces and frozen in trays. The lining should be preserved by covering with one percent solution of sulphuric acid (30 ml of commercial sulphuric acid added into one litre of water) in a large glass jar or enamelled containers. The lining should be transported to the pharmaceutical industry while still submerged in the original acid
(xii)	Hides and skins	Leather	Hides and skins should be collected and transported to place of storage within 8 hours. Hides should preferably be salted before storage
(xiii)	Tail hair, bristles and body hair	Brushes	Generally, tail hair bristles and body hair should be separated and transported within 8 to 10 hours
(xiv)	Bones	Gelatin, glue	The bones should be freed of adhering flesh and dried. Green bones should be broken, cooked and dried. In case of desert bones, they should be neatly laid out on a sloping cement platform in the collection centres. During dry weather, the bones should be sprayed with water to encourage bacterial

S/No.	Name of by-products	Utilization	Handling, storage and transport
(1)	(2)	(3)	(4)
			and insect action, and to wash off unwanted material. Care should be taken not to dry bones in direct contact with earth. Further cooking and processing is similar to green bones
(xv)	Hooves and horns	Buttons, handles, combs, horn meal, foam compound, etc	Hooves and horns freed of pith should be collected and transported to be stored in cool sheds. These should not be exposed to undue heat and desiccation during collection, transport and storage as these may crack or become brittle
(xvi)	Horn pith	Gelatin	Horns should be placed in boiling water for a short period to remove any blood, fat or adhering tissue and pith removed by a gentle tap. The pith should then be cleaned free and stored in mesh-like containers for transport

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