RWANDA STANDARD

DRS 485

First edition

2021-mm-dd

Production and handling of edible insects for food and feed — Code of practice

ICS 65.120

Reference number

DRS 485: 2021

In order to match with technological development and to keep continuous progress in industries, standards are subject to periodic review. Users shall ascertain that they are in possession of the latest edition

Rwanda Standards Board

P.O Box 7099 Kigali-Rwanda

KK 15 Rd, 49

Tel. +250 788303492

Toll Free: 3250

E-mail: info@rsb.gov.rw

Website: www.rsb.gov.rw

ePortal: www.portal.rsb.gov.rw

Contents

Page

Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 485 was prepared by Technical Committee RSB/TC 008, *Animal Feeds and Feeding Stuffs*.

In the preparation of this standard, reference was made to the following standard (s):

1) KS 2921:2020, Production and handling of insects for food and feed — Code of practice

The assistance derived from the above source is hereby acknowledged with thanks.

Committee membership

The following organizations were represented on the Technical Committee on *Title of TC* (RSB/TC 008) in the preparation of this standard.

Production and handling of edible insects and insect derived products for food and feed —Code of practice

1 Scope

This Draft Rwanda Standards specifies the requirements for sustainable establishment and operation of wild harvested or domesticated edible insect production, harvesting and post harvesting handling for food and feed.

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.

RS 428, *Rwanda GAP*

RS 184, *Hazard Analysis Critical Control Points (HACCP)*

KS 2829, *Food animals welfare — Code of practice*

3 Terms and definitions

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

3.1

Organization

person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives

3.2

Harvesting

process of gathering a consumable stage of an edible insect from the wild, semi-natural or a rearing facility.

3.3.

domesticated

farming of insects in established farms where the insects are held in confinement

3.2

production

insect farming activities including post-harvest handling at the farm level and those harvested from the wild

3.3

insect farming

rearing of insects which includes feeding, hatching, growth phase, harvesting and post-harvest handling activities

3.4

semi domestication of edible insects

farming of edible insects by manipulating their natural environment to some degree to enhance their production

3.5

wild harvesting

collecting edible insects from their natural environment

3.6

waste

any substance which constitutes scrap material, an effluent, unwanted substance, article which requires disposing of as being broken, worn out, contaminated or otherwise spoiled

3.7

insect waste products

parts from insects that are not necessarily needed in a food or feed products. (insects that have died naturally, pupae and larvae exuviae, excrement (residue or frass), that has to be discarded)

3.8

post harvesting handling

include, preliminary processing activity (removal of inedible parts, sorting, drying), storage, packaging, labelling and transportation

4 General requirements

4.1 The organization rearing edible insects for food or feed shall:

a) ensure that farms, harvesting and processing sites are legally established and in compliance with applicable laws, regulations and standards;

b)

c) identify, select and maintain pre-requisite programmes that:

1) are able to minimize the likelihood of introducing contaminants and meet the requirements set down in this code of practice

2) enable the implementation of regulatory requirements related to protection against contamination;

3) target the type of farm production, by the processing plant receiving the farm end-product, or by the competent authority;

4) are appropriate to manage identified risks to the safety of insect and insect derived products

5) apply to the size, nature and operations of the farm

6) minimizes the risk of unintentional escape of the edible insects in order to prevent their negative effects to the environment

4.2 The organization rearing edible insects for food or feed shall identify and implement the applicable statutory and regulatory requirements

5 Specific requirements

5.1 Personnel

The organization should ensure that any person (s) involved in the insect farming has a required level of competence, behave and maintain a required degree of hygiene appropriate to edible insect farming, depending on the species.

5.1.1 Responsibilities and competence of personnel

a) The organisation shall determine and communicate the roles, responsibilities and authorities to personnel involved in handling edible insects and derived products to ensure the safety of finished products

b) The organization shall determine the necessary competence of person(s), including external providers, doing work under its control that affects edible insect farming and its food safety performance;

1) Any person deployed in an insect farm should be equipped with basic training or awareness on food safety and to the minimum on the principles of Hazard Analysis Critical Control Points as outlined in RS 184.

2) Supervisors of insect farming operations should have sufficient competence in the following aspects:

i) behaviour of insects;

ii) food and feed safety principles;

iii) ability to identify species of edible insects;

iv) insect's species life cycle;

v) handling of insects; and

vi) how to prevent farmed insects from escaping

c) To ensure smooth operation and management of all personnel, the organization shall ensure that a farm for insects has a person who is overall in charge of the farm and who should possess specialised training and is able to:

1) ensure critical control points are determined, monitored and controlled

2) establish and implement good insect farming practices;

3) identify emerging issues within the farm and establish both correction and corrective actions; and

4) coordinate and facilitate refresher and/or induction trainings of staff working in the farm.

d) The organization shall design, implement and review training program to address the concepts at a level appropriate for the knowledge and skill level of the personnel being trained. The program should consider among others:

1) the nature of the insects, in particular their ability to be infected by and/or carriers of pathogenic or spoilage micro-organisms;

2) the manner in which the insects are handled and packed, including the probability of contamination;

3) the extent and nature of processing or further preparation before final consumption;

4) the conditions under which the insects will be stored; and

5) the expected shelf life.

5.1.2 Personnel hygiene

5.1.2.1 People are a potential source of disease causing micro-organisms. Prevention of contamination of insects by personnel depends on everyone being aware of the potential risks associated with poor hygiene practices and behaving in a manner that will prevent these risks.

5.1.2.2 Adequate hygiene facilities shall be in place and this include:

a) Separate toilet for male and female and urinals for male provided with hand washing and dryer facilities

b) Bathroom and changing room for both male and female

c) suitable protective clothing, head covering, and footwear that is cleaned or changed regularly for personnel and visitors

5.1.2.2 Organization shall establish and communicate practices for personal cleanliness, behavior and operations that are appropriate to the operations related to insect farming and preliminary processing

5.1.2.3 The management should ensure that:

a) All persons entering insect farming and processing areas including visitors and sub-contractors wear appropriate protective clothing that shall only be used at the farm premises;

b) All persons suffering from any communicable diseases or injury should not be permitted to access the production area;

c) Smoking chewing gum, eating and drinking shall be avoided in the production areas.

d) basic first aid facilities are in place

5.2 Infrastructure

5.2.1 Location of the farm

Edible insect farming facilities should not be located where there is a threat to edible insect being reared, food safety or suitability and hazards cannot be controlled by reasonable measures.

The location of farming facilities should not introduce any hazard from the environment that cannot be controlled. In particular, unless sufficient safeguards are provided, facilities should normally be located away from:

a) environmentally polluted areas and industrial activities which are reasonably likely to affect the life cycle of the insect;

b) area where light and temperature conditions are not appropriate to the life cycle conditions of the species

c) areas subject to flooding;

d) loud external noise that could disturb the rearing of specific insect species.

e) areas prone to infestations of pests and pathogens; and

f) areas where wastes, either solid or liquid, cannot be removed easily.

5.1.3 Design and layout

5.2.2.1 The organisation designing the insect farming facilities should pay special attention to good hygienic conditions and provision of adequate measures to protect the health and life of insects and personnel.

5.2.2.2 The selected design, layout, construction, siting, and size should.

a) Allow and facilitate a logic flow of the activities of the firm

b) Prevent contamination, and provide adequate working space to allow for the hygienic performance of all operations;

c) Permit adequate maintenance, cleaning and/or disinfection such as use of foot bath, avoid or minimise airborne diseases;

d) Ensure production units in which insects are reared shall stay closed or fitted with nets or grids or any other appropriate means to exclude other pests, or the contamination with other insects, and prevent the presence of rodents;

e) Have adequate natural and/or artificial light and a controlled environment if necessary;

f) be designed to avoid accidental release of insects from the production facilities;

g) provide a different room for storing/holding processed insect products, in case the organisation produces both types of products;

h) provide adequate drainage and waste disposal systems and facilities;

i) ensure that access to the storage, breeding and farming areas are restricted to the authorised staff;

j) provide a mechanism for proper ventilation system (mechanical or natural) so as to maintain appropriate temperature and humidity as required by insects and staff working in the farm; and

k) where necessary provide for proper zoning and appropriate controls/segregations to avoid any possible cross contaminations.

5.2.2.3 Depending on the mode of farming and species, the facilities should include

a) Rearing area of appropriate size to the level of production

b) Hatching area

c) Post-harvest handling area

d) Feed preparation or processing area

e) Separate and adequate facilities for the storage of feeds, equipment, chemicals used at the farm

f) Offices facilities

g) Personal hygiene facilities

5.2.2.4 **Equipment**

5.2.2.1 Any machine or equipment used in insect farming should not introduce or increase any hazard either to the live insects or that which have been harvested and processed.

5.2.2.2 All machines or equipment deployed should be fit for purpose, installed and maintained such that they:

a) permit adequate maintenance and cleaning;

b) function in accordance with its intended use;

c) facilitate good hygiene practices; and

d) be properly maintained.

5.2.2.3 All monitoring and measuring equipment should be regularly maintained and calibrated

5.2.2.4 Where containers for waste, inedible and/or hazardous substances are provided, they should be:

a) clearly identified for their intended purpose;

b) constructed of impervious material which can be readily cleaned and disinfected;

c) closed, when not in immediate use; and

d) preferably fitted with a foot-operated lid or other suitable means to minimise contamination by hands.

5.3 Insects farming

5.3.1 Insect flock

a) Flock management: Organisation of confined farms should use breeding flocks of a known and traceable origin. The organisation should also maintain consistent population density at each developmental stage; and

b) The organisation should ensure that the insects are farmed in a controlled growing environment designed and maintained as guided by this code.

5.3.2 Farming of insects

5.3.2.1 Farming of the insect is the most critical aspect in the entire insect farming. Organisationis required to apply good farming practices as appropriate and ensure sustainability of operations.

5.3.2.2 Insect farming may be divided into 4 stages namely:

a) feeding of insects;

b) growth phases;

c) harvesting phase; and

d) post-harvest handling .

5.3.3 Feeding and watering of insect

5.3.3.1. Organisations should ensure that edible insects are provided with sufficient substrate and water to ensure optimal growth of the insects being farmed. The organisation should apply any technical or organisational measures that they deem necessary to prevent any risk of contamination of the substrate.

5.3.3.2 The activity of feeding and watering edible insects shall not increase the likelihood of food contamination by transmitting contaminants through edible insects.

5.3.3..3 The organization shall define and implement measures to ensure that feed and water are suitable for the insects and do not increase the likelihood of contaminants.

5.3.3..4 An organisation should apply the following principle directly or modified to ensure good nutrition and safety of the insect:

a) The substrate should be selected by taking into consideration the chosen insect species and intended use (either for food or feed), based on its mycotic, bacterial and viral disease resistance.

b) Substrate delivering equipment should not introduce any hazard to the insects.

c) boxes/cages containing insects and equipment destined to provide the substrate and/or the water to the insect between each batch of production should be thoroughly cleaned.

d) The organisation should put in place a traceability record for substrate used in feeding the insect. They should be to the minimum be able to identify the source and time the substrate was fed.

e) Where an organization is using crops to feed the insects, they shall ensure that crops are grown in controlled areas free of pesticide residues in accordance to the Codex Alimentarius Commission.

f) Depending of the species feed likely to affect the life of insects should be pre-treated

g) When the insects are fed with waste substrates, the organization shall ensure adequate sorting and eliminate component likely to contaminate insect with heavy metals and other chemicals

h) Water used for insect watering should be good quality to avoid contamination with heavy metals

5.3.4 Growth phase

As a general rule, the organisation should control the following aspect as appropriate depending on the insect at the farm.

a) The temperature: insect growth rate is heavily influenced by temperature levels. Temperatures between 20°C to 36°C are most beneficial in the majority of cases.

b) Organization should ensure adequate lighting depending on the insects and the growth stage.

c) Humidity: temperatures shall correlate with a specific level of relative humidity, depending on the phase of development. The organisation should be aware of the appropriate humidity requirement for the species being farmed.

d) Enclosed space: the insect colony should be enclosed and secured to facilitate pest control and prevent insect stock escape. To achieve this, it is recommended to use multiple self-contained spaces, each with its own population, water supply and food sources. In the event of escape, the organisation should notify the relevant competent authority.

e) Ventilation: proper ventilation of the premises is required and shall be suited to the species characteristics and projected temperature/humidity levels. This ensures clean rearing conditions and avoids cross-contamination through the air.

5.3.5 Harvesting phase

5.3.5.1 No fresh substrate should be added prior to harvesting: in some cases, insects should be removed from the growing substrate before harvesting.

5.3.5.2 Harvesting techniques differs from insect to another and therefore the organisation should be familiar with the harvesting requirements of their flock. For example, holometabolic insects (i.e. mealworms, black soldier fly, housefly) are harvested as fully grown larvae, whereas in hemimetabolous insects (e.g. crickets and grasshoppers) are harvested at young nymphaea or adult stage. Cricket adults are often collected by sieving from the growing substrate or by insect collecting nets while Black soldier fly larvae may naturally (at a

mature level) migrate from the moist substrate to a dry environment, where they can be easily sieved manually or mechanically.

5.3.6 Post-harvest handling

5.3.2.4.1 Post-harvest handling should be managed in a way that ensures that the harvested insects are not exposed to possible contaminants that they may carry over to the food or feed.

5.3.2.4.2 Post-harvest processing such as drying of insects should be done within a short time after harvesting and stored in a cool, dry place.

5.3.2.4.3 The processing objective should aim to:

a) avoid the use of areas where the environment poses a threat to the safety of food;

b) control contaminants, pests and diseases of animals and plants in such a way as not to pose a threat to food safety; and

c) adopting practices and measures to ensure products are produced under appropriately hygienic conditions.

5.4 Storage

The organisation should ensure that there are measures in place to:

a) sort the harvested insects from materials which are evidently unfit for human and animal consumption;

b) dispose of any rejected material in a hygienic manner and in accordance to the guidance of this code; and

c) Protect harvested insects from contamination by pests or chemical, physical or microbiological contaminants or other objectionable substances during handling, storage and transportation.

6 Packaging

Post-harvest handled insects shall be packaged in appropriate food grade packaging material that shall protect and safeguard their integrity.

7 Labelling

Labelling should be done in accordance RS EAS 38 and/or product specific standard

8 Documented information

8.1 The organisation shall identify and establish necessary documents and procedure to be maintained and information to be retained for the effectiveness and efficiency of farm operations

8.2 The establishment of documented information shall consider documentation requirements in this standard and those specified by statutory and regulatory requirements

8.3 When creating and updating documented information the organisation shall ensure appropriate

a) identification and description (e.g. a title, date, author, or reference number);

b) format (e.g. language, software version, graphics) and media (e.g. paper, electronic);

c) review and approval for suitability and adequacy.

8.4 Documented information shall be controlled to ensure

d) it is available and suitable for use, where and when it is needed;

e) it is adequately protected (e.g. from loss of confidentiality, improper use, or loss of integrity).

8.5 For the control of documented information, the organization shall address the following activities, as applicable:

a) distribution, access, retrieval and use;

b) storage and preservation, including preservation of legibility;

c) control of changes (e.g. version control);

d) retention and disposal.

8.6 Documented information of external origin determined by the organization to be necessary for the farm operation shall be identified, as appropriate, and controlled.

8.7 Documented information retained as evidence of conformity shall be protected from unintended alterations.

8.8 For the purpose of this code of practice the organisation shall keep and retain the following documented information:

a) Production condition for the species being reared

b) Information proving the competence of the personnel;

c) Specification and acceptance criteria of the incoming materials (feeds, cleaning reagents, pest control products;

d) Identification of risk, hazards and mitigation measures

e) Production process and procedure of undertaking activities

f) source of flock or flock data;

g) production capacities;

h) corrections and corrective measures undertaken during farming;

i) non complying products and how they were handled; and

j) waste management procedure

k) pest control procedure.

l) Relevant statutory and regulatory requirements

9 Pest control management

9.1 Pests pose a major threat to the safety and suitability of food and derived from insects. Pest infestations can occur where there are breeding sites and a supply of food. Good hygiene practices should be employed to avoid creating an environment conducive to pests.

9.2 The organisation should develop and implement a pest management program including such thing as baits, use of chemicals and pesticides as appropriate.

9.3 The pest management program should be monitored and improved where necessary for effectiveness.

10 Waste management

In addition to compliance with requirement as administered by the competent authority, the organisation should ensure that:

a) Suitable provisions are made for the removal and storage of waste.

b) Waste does not accumulate outside of any designated waste storage area.

c) Waste stores are kept appropriately clean.

d) waste are disposed off in an appropriate way to prevent the contamination of the rearing environment, the substrates used to feed the insects and the insects themselves.

e) Insect waste products should be properly treated before disposing them off in order to prevent any further contamination to the environment.

CD XXX: 2021

Price based on nnn pages