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KENYA BUREAU OF STANDARDS (KEBS)

Apiculture Industry

Pollen – code of practice - 2019

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Technical Committee Representation.

The following organizations were represented on the technical committee:

- Egerton University
- National Beekeeping Institute
- Kenya Industrial Research & Development Institute
- National Museums of Kenya
- National Public Health Laboratories
- Government Chemists' Department
- Technical University of Kenya
- Janisa Ltd.
- Apiculture Ventures Ltd
- Maynard Farm
- Consumer Information Network
- Kenya Bureau of Standards
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Foreword

This code of practice was prepared by the Apiculture Products Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

During the preparation of this code of practice, reference was made to the following documents:

Code of Practice: Processing of Bee Products- Part 2: Good Manufacturing Practice Amendment 3
Receipt and Processing of Honey and Dried Pollen - Records relating to compliance with the Food (Tutin in Honey) Standard 2010
BEE POLLEN — AN OVERVIEW-- http://www.beeculture.com/bee-pollen overview/
Value added Products From Beekeeping by R. Krell - **FAO AGRICULTURAL SERVICES BULLETIN No. 124 -** Food and Agriculture Organization of the United Nations Rome 1996

The assistance derived from the above sources is highly acknowledged

2. SCOPE AND APPLICATION

This code covers the harvesting, processing, packaging and placing in the market of Bee Pollen.

The code Applies to plant pollens collected by the honey bee, that is intercepted by pollen processors for human use.

3. 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

I. *KS EAS 39 - Hygiene in the food and drink manufacturing industry - Code of practice.*

II. *KS ISO 22000 Food safety management systems - Requirements for any organization in the food chain.*

III. *KS EAS 151 - Hazard analysis critical control points (HACCP).*

IV. *KS EAS 38 - Labelling of pre-packaged foods*

4. DEFINITIONS more to be added as deemed necessary by members

For the purpose of this code of practice ~~standar~~d the following definitions shall apply:

4.1 Pollen

Bee pollen is a ball or pellet of field gathered flower pollen packed by worker honeybees. Its primary use in the hive is as a source of food to bees (honeybee larva and workers) also called bee bread. It is stored in brood cells sealed with drops of honey.

- Produce Handlers
- Contaminants
- Allergen
- Food Grade Material
- Traceability
- Apiarist- One who manages an Apiary

4. Production

4.2 Composition

Composition of pollen depends from plant to plant and can also vary from time to time (hour, day, and week) and also from colony to colony. For this reason, some pollen sources are considered of higher value than others. It consists of simple sugars, protein, minerals, vitamins, fatty acids and a small percentage of other components.

" The colour and chemical composition of bee pollen varies depending on the floral sources, consequently the colour of bee pollen can be yellow, red, purple, green or even brown.

~~The color of bee pollen is frequently yellow, red, purple, green and brown.~~

4.2 Collection and harvesting

Bee pollen is collected by the use of pollen traps. The pollen trap is " a frame that contains a wire mesh to allow the bee to enter the hive. The trap

harmlessly removes the pollen from the hind legs of the worker bees and allows it to fall through the screen into a drawer where the pollen is collected."

Diagram 1: Pollen trap positioned onto A Beehive

The trap is removed from time to time to allow the bees continue to feed adequately.

Diagram 2: Pollen Collection Tray

Collected pollen should be temporarily stored in a ventilated container and transported to suitable premises for processing.

The collected pollen is then sold fresh, frozen or dehydrated

Pollen should be collected every 3 to 4 days and before any significant rain. In wet weather, pollen, which becomes damp, may start to grow mould and rot after 4 to 5 days.

Pollen containers should be kept out of the sun to prevent ‘sweating’ and clumping of pellets, and to minimize microbiological growth.

4.3 Processing.

4.3.1 General

4.3.1.1To prevent deterioration pollen should be processed soon after collection. The operator must ensure that pollen received for processing is fit for intended purpose.

4.3.1.2 Pollen must not be mouldy. Mouldy pollen is not fit for human consumption and must be discarded. Pollen is subject to spoilage from moulds, fungi and bacteria due its high moisture content. Fresh pollen contains 10-12% of moisture hence the moisture content should be reduced to about 4% / < 8% for preservation.

There are three stages in processing pollen for human consumption: drying, cleaning and storage

Pollen can be stored either in frozen state or dried but is best consumed dry.

4.3.2 Drying

Drying of pollen must be done in a manner that minimizes the contamination of the product and the growth of any microorganism present in the product.

A simple drying procedure can be effective. Air drying can be used to reduce the moisture content of pollen and should normally get the pollen dry enough for marketing. For air drying pollen is spread about 20mm deep in shallow trays with fly wire bottoms and it should not be placed in direct sunlight and may have to be protected from bees.

Air drying systems can be developed at low expense and effective for batch lots of pollen. Warm dry air is forced through the pollen, removing the moisture. The recommended drying temperature is 45°C.

If pollen is trapped and stored for feeding to the bees, drying the collected pollen is not required if it can be frozen. The process of drying pollen will reduce the nutritive value; hence pollen is collected and frozen in sealed containers to retain the maximum levels of nutrients to meet honey bee requirements.

As an indicative estimate of moisture content, typically when breaking the pollen pellet is attempted between the finger nails: if it does not disintegrate and is difficult to break- moisture is 2-5%; and if it breaks with pressure but does not powder moisture is above 5%;

Pollen must be dried to a final moisture content sufficient for the preservation of the product considering its intended packaging and storage conditions.

4.3.3 Cleaning

4.3.3.1 Cleaning equipment

A simple birdseed cleaning unit which uses a vacuum cleaner for the air supply may be suitable for cleaning small quantities of pollen. Sieves can also be used.

Large quantities may need to be processed in a commercial seed-cleaning machine. These contain vibrating riddles or screens which sift out the pollen into different sizes. They also have an air current to remove the dust and fine debris.

4.3.3.2 Cleaning procedure

Pollen cleaning is carried out after the pollen is dried. Dried pollen must be cleaned to ensure that the product is free of all foreign matter such as dead bees, wax, insect parts, wood, dust, and other debris.

Cleaning of pollen is simplified if the amount of waste is reduced in trapping.

Basic cleaning of small pollen collections can be carried out with a series of hand sieves. First, the dust is removed with a sieve of fine fiber glass mesh. The pollen is then passed through two closely held mesh screens to remove larger debris.

An alternative is a gravity fed screening system. The pollen is poured over a slanted slotted screen capable of withholding large debris. The pollen passes through successive screens with a collection box at the bottom of each plate. Below the lowest plate is a box for collection of dust.

4.4 Storage

Immediately after drying and cleaning pollen should be packaged in clean airtight containers. If allowed to stand in open air for any period of time the pollen will absorb moisture from the air and subsequently deteriorate.

No fumigants are recommended as pollen which has not been treated has a higher market acceptance. To protect pollen from insects' infestation sealed containers of pollen should be frozen for 24-48 hours then stored under normal refrigeration.

Pollen intended for human consumption should be stored in a deep freeze or as dried pellets in air tight containers at room temperature.

4.4.1 Cold chain Management

Cold chain facilities shall be available, and shall be in satisfactory structural conditions of adequate cleanliness. Recommended produce temperature, and humidity shall be documented and be maintained at all times

4.4.2 Freezing

Fresh pollen must be placed in a freezer without unnecessary delay especially if the pollen is wet. Freezing will prevent microbial growth and spoilage, and kill wax moth and pollen mite. Pollen should be frozen at -18 °C for at least 48 hours to destroy wax moth. Contamination of the pollen must be prevented during freezing. Pollen must be properly packed and identified. The date packaged to be included.

The freezer must have the capability to quickly freeze pollen to the required temperature. The pollen must be loaded in the freezer in such a manner that allows effective freezing of the product.

5. Hygiene requirements

5.1 Contaminants

Pollen must not be contaminated with rodent droppings and pests such as cockroaches and ants.

Processors of pollen should require their suppliers to have an effective pest control system in place at the hive and storage facilities to minimize contamination of pollen by pests.

The presence of rodent droppings indicates that there is a hole in the trap or hive, or gear is being contaminated during winter? Storage.

The presence in pollen of dead bees, wax, insect parts, wood, dust and other foreign matter in pollen must be minimized.

5.2 Handling

Operators shall ensure personal hygiene of produce handlers.

HACCP principles should be used to set up a system of managing product quality. A risk assessment or own farm inspection shall be done when determining the process flow and its associated systems. This assessment shall consider areas where health hazards to the produce may occur and also areas where quality aspects of the produce are likely to be affected. This shall include preventing contamination from foreign bodies such as pieces of string, glass, metal, hair, nails, knives, other produce etc. These assessments shall be documented and periodically.....? reviewed?.....

A personal hygiene policy should be established and implemented to ensure that pollen is not contaminated during handling:

a) Written instructions for acceptable personal hygiene should be visibly displayed at appropriate areas and enforced.
b) Visitors to manufacturing and storage areas should be sensitized on hygiene practices and wear protective clothing as appropriate.
c) A documented and effective training program will be in place to ensure that employees, contractors and sub-contractors are competent in assigned duties, and are conversant with hygiene, accidents, and emergency procedures and any other issue critical to food safety.
d) The farm production unit shall have a documented hygiene procedure/protocol for handling of product premised on the basis of a risk assessment and workers should be trained and evidence availed. There shall be a regular hygiene risk assessment of harvesting operations.
e) The containers, harvesting tools and other harvesting equipment that are continuously used must be appropriately cleaned, disinfected and maintained in line with the hygiene procedures/protocols. A planned washing program shall ensure that produce harvest containers are cleaned, and free from contamination.
f) Cleaning water shall be free from microbial, heavy metal or other foreign body contaminants and where possible recycled and treated before reuse. Procedures and training programs shall ensure that all workers involved in handling of produce observe

high standards of personal hygiene. Personal hygiene facilities including field toilets with hand washing facilities shall be provided and kept clean.

g) To avoid contamination of product, field supervisors shall ensure that field workers involved in handling of product are in good health and that field workers with communicable diseases are not knowingly employed in fields operations. Employees shall be instructed to report to the supervisor if they are suffering from any illness either on arrival for work or during working hours.

Smoking, eating, chewing and drinking shall not be permitted in the immediate vicinity of harvesting, grading, packing, or storage operations. Signs shall be displayed to this effect.

5.3 Incompatible goods

All incompatible items incompatible with produce including cleaning agents, lubricants among others, shall be stored in designated areas away from product to prevent taint, ethylene damage or cross contamination of product.

5.4 Product Integrity.

Operators shall ensure the integrity of product consignment throughout the handling phases including storage, transportation, repackaging where necessary, and loading into a freight vessel.

6. Quality control and monitory (monitoring) systems

6.1 Quality control

The operator shall have a quality assurance system. Quality control unit shall be within the vicinity of the pack house and shall be equipped with quality control facilities, equipment, procedures, standards and records as required.

All measuring devices shall have the necessary accuracy as required for inspection purposes. All equipment used for weighing, sizing, temperature monitoring or any other measuring devices shall be calibrated regularly and records maintained.

6.2 Traceability and inventory control

There must be a system in place for the identification of raw materials and products, and documentation that will allow any finished product to be traced back to the supplier and the apiaries that the bee product was sourced from; and to the next person or company that the product is transferred to for further processing, packing, or storage; distributed to; or sold to.

All outgoing products must be clearly identified and accompanied by appropriate documentation.

Inventories must be maintained for all raw materials (e.g. incoming honey, pollen) and finished products, including any non-compliant materials and products.

Commented [o1]: Records Management.

6.3 Records

Records containing the following information must be kept:

a) *Apiarist and Beekeeper Statements* (Harvest Declarations) or equivalent records
b) Records for identifying products and establishing traceability
c) Inventories
d) Observations from monitoring and any corrective action taken (including restoration of control, product disposition and prevention of recurrence).

7. Construction of pack house

Construction of the pack house shall be such as to prevent the entry of domestic animals, insects, birds, rodents, among others. Effective control measures shall be in operation and be fully documented.

Floors, doors and wall surfaces shall be made of impervious, non-absorbent, non-toxic, washable materials, which are easy to clean and disinfect. Floors shall be durable and allow easy drainage without leaving wet areas. Windows and doors shall open and close easily.

Ceiling and overhead fixtures shall be designed, constructed and finished to prevent the accumulation of dirt, growth of undesirable moulds, shedding of paint flakes or particles and also reduce condensation.

Windows and other openings shall be constructed and finished to prevent the accumulation of dirt. Those that can be opened to the outside environment shall be fitted with insect proof screens of appropriate mesh size.

There shall be a glass and hard plastics handling policy to govern their use within the premises whenever they are used.

The use of glass shall be avoided. Where glass is used, there shall be a form of screening to prevent any broken glass contaminating the produce. All use of glass (windows, lights etc.) shall be recorded and a system of inspection implemented to ensure that any breakages are rectified.

Lighting over inspection, grading and cold store areas shall be adequate to allow effective inspection of produce. The pack house shall have adequate ventilation in order to provide adequate air circulation and temperature control. The height of grading working tables and other facilities for work shall be appropriate for the comfort of the workers. Loading and dispatch areas shall be roofed and proofed so as to prevent the nesting of birds.

8. Personal protective equipment

As appropriate, all workers should be provided with personal protective equipment as per the requirements of the Occupational Safety and Health Act (2007) Cap 514 Laws of Kenya.

Visitors should wear appropriate, wear protective clothing and adhere to other hygiene provisions in this code

9. Packaging and labelling

9.1 Packaging

Pollen should be packed in food grade materials that secure product integrity.

9.2 Labelling

Labelling of packages of pollen shall be done in accordance with the requirements stipulated in KS *EAS 38, Labelling of pre-packaged foods)* and shall include the following:

a) Name of the product

b) Name of bee species from which the pollen is derived

c) name, location and address of ~~manufacturer;~~ processor;

d) net weight, in g or kg;

e) date of production/packaging

f) expiry date;

g) batch number;

h) storage ~~conditions~~ instructions;

i) country / geographic region of origin

9.3 Allergen information

Package of pollen should include an advisory statement to the effect that the product contains bee pollen which may cause severe allergic reactions.