DRAFT NIGERIAN CODE OF PRACTICE DNCP XXXX

Code of Practice for Honey - Processing and Packaging

Approved by: **price group:**

SON

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FOREWORD

Honey in its natural form requires proper handling during processing and packaging in order to maintain its' quality and safety. This Code of Practice covers Good Manufacturing Practice (GMP) for the consistent production and packaging of product that are fit for their intended purpose.

In elaborating this Code of Practice, references were made to National, International Standards and inputs from bee farmers; honey processors and packers, and academia are hereby acknowledged.

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1.0 Scope

This code of practice provides guidance on hygienic practices and process control that directly or indirectly impact on the safety and quality of honey.

2.0 Normative Reference

Use standard chapeau clause for normative references…

2.1 CODEX Standard for Honey CODEX STAN 12-1981 Revision 1987 and 2001
2.2 Nigerian Industrial Standard for Honey NIS 473:2003
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2.4 Nigerian Industrial Standard for Drinking Water Quality NIS 554:2015
All undate references – as latest editions will apply
Format as per SON requirements (number – Title)

3.0 Terminology

For the purpose of this Code, the following shall apply:

3.1 **Apiary**

A place where bee hives of honey bee colonies is kept.

3.2 **Bee**

Insect scientifically referred to as *Apis mellifera* or *Trigona* species**.**

3.3 **Bee colony**

Honeybee family consisting of thousands of individual bees living together as one social unit.

3.4 **Traditional bee keeping**

Use of traditional techniques of beekeeping, harvesting and processing honey and other bee products, using various traditional styles of hives and other equipment.

3.5 **Modern beekeeping**

Means Keeping of bees in hives having top bars or provided with frames on which honey combs are anchored by the bees.

3.6 **Honey**

Natural sweet substance produced by honey bees from nectar of plants or from secretion of plants or plant sucking insects on living parts of plants which the bees

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collect, transform, deposit, dehydrate, store and leave in honey combs to ripen and mature (NIS XXXX)

3.7 **Brood**

Any immature stage of a honey bee including the egg, larva and pupa or any honeybee which has not emerged from its cell in a honey comb.

3.8 **Comb-Honey**

Honey stored by bees in the cell of freshly built broodless combs and sold whole comb or secretions of such comb

3.9 **Blossom honey**

Honey that is wholly or mainly derived from the blossom or plant specie.

3.10 **Extracted Honey**

Honey obtained by centrifuging de-capped broodless combs

3.11 **Contamination**

The presence of undesirable chemicals, e.g. detergent or foreign bodies, e.g. glass; or living organisms, e.g. Salmonella in a food3.12 **Cross-contamination**

The transfer of microorganisms from one source such as raw food, people, equipment or the environment, to another source.

3.13 **Detergent**

A chemical used to remove grease, dirt and food particles from a surface, e.g. washing-up liquid, soap

3.14 **Disinfectant**

A chemical or process used to reduce numbers of microorganisms but not necessarily microbial spores on a surface to a safe or acceptable level, e.g. chlorine, bleach, ultra-violet light.

3.15 **Microorganism**

A life-form that generally cannot be seen with the naked eye, e.g. bacteria, viruses, yeasts, moulds or parasites

3.16 **Protective Clothing**

special garments intended to preclude the contamination of animal material or animal product that are used as outer wear by persons; and includes head covering and footwear.

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3.17 **Potable water**

Water meeting the minimum requirements laid down in Nigerian Industrial Standard for potable water NIS 554:2015

Water that is of good quality and safe for drinking

Note: NIS 554 specifies requirements for the quality of safe drinking water

3.18 **Sanitise**

The application of an approved maintenance compound or physical agent with the intention of reducing microbial contamination to the level that will avoid the creation of a hazard.

4.0 General Requirements for Bee Hives

4.1 Requirements during the construction of traditional hives

4.1.1 Traditional hives should be properly constructed from durable materials, which have no scent that can affect the bee colonisation process. The material use shall not have a negative impact on the quality of the honey and shall not be made of materials that are not approved for use in the production of food unsuitable products include: cement bricks; untreated metal containers such as drums; faecal material such as cow dung; and, non-food grade plastics.

NOTE: Materials used In the construction of traditional hives, can include among others: bamboo, reeds, palm, clay, straw , clay bricks or logs.

4.1.2 Where hives are constructed from logs, the logs shall be well dried before use, they should not be burnt.

4.1.3 The ends of the local hives or log hives should be covered with wood or woven materials..

4.1.4 After construction, the interior of a log should be smoothened, then cleaned and properly stored in a cool dry place.

4.1.5 The dimensions of beehives should provide an environment that meets the desired conditions for the bees. Similarly the hives should be constructed in such a manner that they are easy to inspect externally for the presence of pests.

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4.2 Requirements for the construction of improved and modern hives

4.2.1 General requirement

a) Modern hives shall be constructed from long lasting or durable well-seasoned dry timber, which is free from knot holes, and cracks. The timber shall have good smell that is not offensive to the bees.

b) During construction, well-seasoned and planed timber shall be used, and all sections shall be glued and securely nailed. The sizes of common nails recommended for use during construction shall include:
(i) 50 mm for general use;

(ii) 2 mm to 50 mm at each corner; and

(ill) 25 mm for the corrugated iron sheets, sides and underside;

c) All sharp edges or splinters shall be removed from the bee entrances to the hive and all cracks and gaps filled with suitable gap filler;

d) Neither shall the timber used for the construction of the hive nor the hive after construction be painted or applied any wood preservative that can have a negative effect on the honey. Inside structures can be coated with molten beeswax to preserve the wood; external surfaces can be painted with an oil-based (heavy metal free) paint if needed.

note: that Black and red colours are not advised as these colours agrivate bees while white, yellow and green have been found to attract and calm bees and should be considered

4.2.2 Specific requirements for modern hives include the following:

a) Modern hives should be properly constructed. The bars or frames should fit properly into the main body of the hive. When the hive is fully assembled, the bars or frames should provide for adequate space to enable the bees to construct honeycombs;

b) The overall top cover of the hive should fit properly on the hive. It should provide for easy removal during inspection and harvesting and should prevent the hive from adverse weather conditions like rain ans direct sunlight;

c) top-bars or frames should be provided with a base material in the form of beeswax to act as a bait and therefore promote early colonisation. In the case of top bars, this can be a thin coating of wax along the bottom rib, while for frame hives, the frames fitted with foundation sheets or foundation strips.

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d) the recommended dimensions of a top bar hive is important for the quality of honey. The rack width shall be no less than 2cm

……advice can be obtained from the beekeepers association ……

5. Requirements for establishing an apiary

5.1 Sitting, display and installation of hives

Before hives are installed at any site they should be well baited with beeswax, to enable faster colonisation by the bees.

5.1.1 Criteria for selection of a site for establishing an apiary

The following provisions shall apply when selecting a suitable site for an apiary:

a) The site shall be easily accessible by both the bees and the beekeeper.

b) The site shall be hygienic with no potential sources likely to contaminate the forage especially agrochemicals. There shall be low frequency of insecticide application in the area.

c) The site shall neither be water logged nor in a dense damp forest.

d) There shall be adequate number of flora (forage source) to serve as a source for nectar and pollen, a good source of shade, in any case the hive should be away from direct sunlight and have a source of water, good air circulation but free from excessive effect of winds.

5.1.2 Recommended practices during installation of hives

The following shall apply.

a) Before installation of hives, the site shall be slashed, fenced off and protected from the intrusion of animals and humans.

b) A hive should be sited away from the next beekeeper and appropriate distance from people, livestock, and public places, in any case a minimum of 100 m from public places.

c) As far as practicable, steep slopes or gradients, should be avoided.

d) The hives shall be protected from pests especially termites, black ants and the area shall be slashed to keep away fire.

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e) Hives shall be installed on strong poles for example, metallic poles or poles with capability to germinate (live poles). To enable ease of inspection and harvesting, hives shall be sited at the waist level from the ground. Where germinating poles have been used, pruning shall be done regularly to reduce possibilities of pest infestation.

f) The wire used for hanging hives shall be smeared with grease to prevent attack of ants that could destabilize the colonies.

g) Areas subject to flooding shall not be used except sufficient safeguards are provided.

h) hives should be orientatated t best suited to the bee flight paths – it is recommended that the opening faces either East or West

5.2 Hive deployment

Hive deployment may be in one of the following patterns: straight line; T-Pattern-zigzag pattern; or cross pattern.

6 Inspection of apiaries and beehives

6.1 Inspection of apiaries

An apiary shall be inspected:

a) To ensure that the surroundings are not overgrown with weeds, which if present shall be slashed;

b) For the presence of pests along the supporting poles; on the wires, or on the outside of the hive itself; if present remedial actions can be sought such as re-coating the surfaces, using rat and reptile guards and oil baths.

c) For the presence of water in the containers provided as the water source, and if depleted, these shall be replenished.

d) Morning or evening hours are considered as being suitable for inspection purposes due to relatively low temperatures and at these times of the day, bees are calmer and less aggressive.

6.2 Inspection of modern hives

6.2.1 At regular intervals, the hives should be opened for internal inspection and this should be done in a calm manner (without making any excessive noise).

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6.2.2 Internal inspection of the hive can disturb the colony and should be done with care.

6.2.2 During an early period of colonisation, regular and careful inspection could be done so as to check on the comb construction.

After this, the hives should be inspected externally at regular intervals at least once a week and internally at monthly intervals , to check on progress of colonisation, or any disturbances that could have occurred to the colonised hive.

5.2.3 For proper inspection of modern hives the following steps shall be followed.

a) With a hive tool or knife, remove a couple of bars from the rear side to create working space.

b) Examine a bar at a time by looking at one side first and then the other side and put it back in its original position on the hive.

c) Hold the bar with combs firmly between thumb and next two fingers, vertically above the hive to avoid its breakage and dropping the queen outside the hive.

d) Avoid crushing the bees as this triggers the release of pheromones which provokes other bees into aggressive action including attack and stinging action.

e) Combs which are constructed together or fastened to the walls of the hive or across the hive should be cut off with a knife and the bees allowed constructing the comb afresh. Experienced beekeepers can reposition or re-orientate the combs.

Any comb material shall be properly disposed of in order to prevent wax moth infestation.

6.2.4 During inspection the following shall be noted:

a) The strength of the colony, observing the brood(eggs, larvae and pupae);

b) The presence of the queen. In case she is hiding, the newly laid eggs are an indicator of her presence;

c) Prolificacy of the queen, that is, whether she is laying enough eggs or not;

d) the health status of the colony, especially the presence of bee pests and bee diseases; the indicators of bee diseases include physical observation of the parasite in the hive or on the bees, bees becoming less active, the number of eggs laid by the queenbee becoming progressively less than normal, weak colony, a very low number of colony members, low hive productivity, abscondment or swarming from diseased hives and death).

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e) The food stores (honey and pollen);

f) Maturity of honey as indicated by capping of the honey cells. At least three quarters of a comb shall be capped;

g) The adequacy of space for the available bees; in case it is inadequate, remove some brood combs and replace with empty bars; and

h) Indicators of swarming which include construction of many queen cells. In this case, destroy some and provide more room provided the queen is still present.

76 Harvesting of honey

76.1 General

When still in a hive, honey is a perfect natural product and therefore requires proper handling during harvesting in order to maintain its quality. During harvesting only sealed or capped combs shall be harvested and then sorted according to colour of the comb.

It is a good practice for farmers to keep a bee calendar which shall provide guidance on the time when harvesting is expected to take place. The bee calendar should among others indicate the flowering regime of the plants, time of colonization and time of siting..

6.2 Indicators and techniques used for assessing the presence of mature honey in the hive

The indicators for the presence of mature honey in a hive include the smell of honey from the hive; clustering of bees outside the hive; bees are observed not to be carrying pollen; bees become more aggressive; or the honeycomb being fully capped or sealed at the time of inspection.

The behaviour of the local flowering plants can be very useful in determining when honey may be harvested with maximum results. Mature honey can be obtained when the local flowering plants drop most of their flowers. At this time the bees have capped most of the honey in their nest.

6.2.2 Observation of the colonies

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The beekeeper should always observe the colonies for indicators of bees being ready to swarm and these include ceasing of brood rearing as characterized by foraging bees sending little or no pollen into the hive.

Few bees are seen at the entrance during the day; but most of the bees continue buzzing and ventilate the hive at night.

7.2.3 Inspection of the honeycomb

During inspection, the honey cells are found to be capped. The hive smells of honey when it is approached.

The guard bees or security bees at the entrance become more aggressive than ever and send out patrols to attack any potential intruder loitering in the vicinity. The population of the hive is now at its peak.

7.3 Preparation for harvesting of honey

6.3.1 Inspection of the apiary

The apiary shall be inspected to ensure that the conditions are conducive to harvesting of honey; especially the environment should be hygienic and not polluted with agrochemicals, human or animal waste or garbage in general.

6.3.2 Preparation of equipment

Before the harvesting of honey, equipment such as airtight buckets, knives, etc that may come into direct contact with the product shall be washed with potable water and shall be dried properly.

6.4 Techniques for honey harvesting

6.4.1 Equipment for honey harvesting

The tools for harvesting include clean airtight honey containers, knives, bee brush or quill feather and hive tool.

a) Honey containers may be made of earthenware, stainless steel, or airtight buckets, but shall always be rustproof.

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b) Safety gear shall include overall, gloves, bee-veils, gumboots (rain boot) and a torch (if harvesting at night).

c) Smoking instruments or materials including a bee smoker, smoking materials, for example, grass, maize cobbs, oil palm inflorescence, wood shavings, dried paw paw stems, dried cow dung, papers and source of fire.

7.4.2 Preliminary preparations

After inspecting the apiary and the hives, steps shall be taken to ensure that all the required equipment indicated in 7.4.1 is prepared and made available before harvesting can start.

76.4.3 General harvesting techniques

These are applicable to all types of hives and include the following.

a) Before opening the hive, a small amount of smoke shall be puffed into the hive using a smoker.
Then open the hive and, remove the combs one by one (giving a very small puff of smoke, if necessary) and examine the combs carefully. Empty combs, brood combs, and combs containing both brood and honey or uncapped honey should all be returned to the hive.

b) Select only combs that are either full or three quarters full of ripe honey. When such a comb is found, brush any bees on it into the hive and use a knife to cut the comb honey away into an airtight bucket. Close the bucket immediately after the honeycomb is put in.

c) Leave about 1 cm of the comb on the top-bar to guide the bees to work the next honey crop.

d) Carry on with the harvest until combs containing honey and brood are reached and at this point harvesting should be stopped as mature honey is finished from the hive.

e) Some combs may not be easy to remove because the bees may have attached them to each other.

This usually happens when inadequate space was left between the top-bars. In this situation a hive tool or knife shall be used to separate them.

f) In hives where the hive entrance is located in the mid-section (rather than at the end), honey is always found on both sides of the entrance. Harvesting shall start on one side

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of the entrance, after which treat the other side in the same manner, but leaving ten combs in the middle. The bees will then work faster to produce the next honey crop than if all honeycombs were taken away.

g) After removing the surplus honey, rearrange the top-bars carefully in the same manner as before. If bees are rushing out between top-bars, drive them back with smoke, but avoid crushing them unnecessarily. Then close the hive carefully, making sure the lid is firmly placed on the hive. Cork the smoker after work is done. Do not throw leftover fuel into the bush as it may cause bush fires.

6.4.4 Specific requirements for harvesting of honey from traditional hives

In case of traditional hives, open the hive and cut the mature honeycombs from the rear side of the hive as the brood is usually found near the entrance. Honey mixed with brood combs shall not be cut out.

6.5 Precautions during harvesting

6.5.1 General precaution

When stung during the harvesting process, you should move away from the location as far as possible before removing the sting. As soon as you are sure that the distance is safe, then remove the sting by scrapping it off with a hive tool, knife or with a finger nail. Never remove it by squeezing as this leads to venom release into the flesh which leads to more swelling of the body and releasing of pheromones that attract more bees into stinging action and attack.

6.5.2 Precautions while harvesting at night

Harvesting at night requires a source of light, however depending on the source of light there are various precautions that have to be taken to ensure that the desired quality of honey is achieved while at the same time ensuring that the colonies are not destabilised. It is therefore important that all necessary precautions are taken to ensure that:

a) As few bees as possible are burnt to death by the lanterns or hive torches that are used;

b) The loss of brood combs shall be minimized;

c) Accidental crushing of bees between top-bars shall also be minimized; and

d) The bars shall fitted fitted promptly .

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e) Care shall be made to ensure that harvested combs do not drop to the ground to prevent attracting ants and other pests to the apiary.

f. Buring embers should not drp on the ground

6.5.3 Precautions while harvesting in daylight

One simple and effective system for harvesting honey or controlling the brood nest with little or no danger, even during the hottest hours of the day, makes use of the fact that foraging bees always return to the site of their hive, even if the hive is no longer there. To harness this fact, the following precautionary steps may be taken during harvesting.

a) Bring along to the site an empty hive and a container with a lid for carrying the harvested honey.

b) Smoke the hive heavily from the outside to force the "security bees and guard bees" and any other bees of the colony that are waiting outside the hive to return to it. It is important to continue smoking until the bees have lost all their aggressiveness.

c) Carry away the hive from the site, in the direction opposite to the flight runway, and placed on a platform (or on the ground) at least 50 m from the nearest hive in the apiary. The empty hive is left at the hive site to serve as a temporary home for any returning foragers or for any bees that escape from the moved hive.

d) Working as quickly as possible in order to avoid robber bees, which can otherwise cause trouble, carry out the harvesting or control operations in the normal manner.

e) When the work is completed, the hive is closed and carried back to its original position, and the empty hive is removed. Any bees in it, or members of the colony waiting outside, will then rejoin the hive.

87 Processing of the various types of honeys

87.1 Processing of comb honey

87.1.1 The cut comb shall be processed (cutting and packaging) from selected pieces of sealed, clean and undamaged combs.

87.1.2 In case of frame hives, honey shall be produced from frames which do not contain strengthening wire.

87.2 Processing of strained honey

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87.2.1 Strained honey shall be prepared from combed honey by uncapping the comb, followed by breaking the comb into pieces and straining using a clean cloth of mesh 500 microns or 200 microns (the use of unsealed combs having unripe honey or pollen is not advisable; as it may lead to deterioration in quality).

87.2.2 Where framed honey combs are to be processed using a centrifuge, the combs shall be uncapped using an uncapping knife or uncapping fork or a suitable kitchen knife previously dipped in warm water. The frames shall then be put in a centrifuge extractor to allow the dripping or separation of honey from the uncapped comb.

87.3 Storage of processed honey

After processing, the product shall be kept in airtight containers.

Containers shall be made of food grade material, shall be thoroughly cleaned and shall not contain any traces of residue that can be harmful or affect the quality of the honey.

98 Plant construction and layout

8.1 Requirements for plant location, size and design

The building and surrounding area shall be:

- such as can be kept reasonably free of objectionable odours, smoke, dust, or other contamination;
- of sufficient size for the purpose intended without crowding of equipment or personnel;
- be easily cleaned and sanitised
- be impervious, non-absorbent, and free from depressions, pits, cracks, and crevices that may harbor contaminants;
- be unaffected by any corrosive substance with which it is likely to come into contact, to the extent necessary to ensure that it will not harbor contaminants and is not a source of contamination;
- of such construction as to protect against the entrance or harboring of insects or birds or vermin;
- in the case of surfaces(other than those used for walking or standing on during operations),be smooth and minimize the accumulation of condensation;
- be durable, resistant to fracture, and capable of withstanding repeated exposure to normal cleaning and sanitizing;

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- so designed as to permit easy and adequate cleaning. In areas experiencing high concentrations of air-borne pollutants, equipment shall be used to remove pollutants from the air blown across or through the product; and
- In the case of materials lining the walls, floors, and ceilings, be of a colour that does not disguise contaminants having regard to the lighting arrangements.

8.2 Requirements related to sanitary facilities and controls

8.2.1 Separation of processes

Handling area shall be completely separated from any part of the premises used as living quarters

8.2.2 Water supply

The water used shall be of good quality complying with potable and shall comply with NIS 554:2015

8.2.3 Plumbing and waste disposal

8.2.3.1 All plumbing and waste disposal lines (including sewer systems) shall be large enough to carry peak loads. All lines shall be watertight and have adequate traps and vents.

8.2.3.2 Disposal of waste shall be effected in such a manner as not to permit contamination of potable water supplies. The plumbing and the manner of waste disposal shall be approved by the official agency having jurisdiction.

8.3 Lighting and ventilation

8.3.1 Lighting must be of a sufficient intensity and quality to enable satisfactory performance of all operations. Light bulbs and fixtures suspended over food in any step of preparation shall be of the safety type or otherwise protected to prevent food contamination in the case of breakage.

8.3.2 Good ventilation is important to prevent both condensation (which may drip into the product) and mould growth in overhead structures which growth may fall into the food.

8.4 Toilet-rooms and facilities

8.4.1 Adequate and convenient toilets shall be provided and toilet areas shall be equipped with self- closing doors.

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8.2.6.2 Toilet rooms shall be well lit and ventilated and shall not open directly into a food handling area. They shall be kept in a sanitary condition at all times.

8.4.2 There shall be associated hand-washing facilities within the toilet area and the notices shall be posted requiring personnel to wash their hands after using the toilet.

8.4 Requirements for equipment and utensils

8.4.1 Materials

All food contact surfaces shall be smooth, free from pits, crevices and loose scale, nontoxic, unaffected by food products, and capable of withstanding repeated exposure to normal cleaning and non-absorbent unless the nature of a particular and otherwise acceptable process renders the use of a surface, such as wood, necessary.

8.4.2 Sanitary design, construction and installation

Equipment and utensils shall be so designed and constructed as shall prevent hygienic hazards and permit easy and thorough cleaning. Stationary equipment shall be installed in such a manner as shall permit easy and thorough cleaning.

8.4.3 Equipment and utensils

All equipment that come into contact with edible honey must be designed, constructed, installed and operated in a manner that;

- Ensure the effective performance of the intended task;
- Ensure effective cleaning;
- Facilitates good hygienic practices, including monitory; and
- Does not cause contamination of the product

8.4.3.2 Equipment must be

- Durable;
- Resistant to chipping, flaking, delamination, abrasion;
- Able to withstand exposure to heat, water and honey under normal operating; conditions; and
- Corrosion resistant.

8.4.4 Hand-washing facilities

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8.4.4.1 Adequate and convenient facilities for employees to wash and dry their hands shall be provided wherever the process demands. They shall be in full view of the processing floor.

8.4.4.2. The facilities shall be kept in a sanitary condition at all times.

9 Plant facilities and operating requirements — Environmental hygiene

Buildings and equipment shall be designed, constructed, maintained and cleaned to standards that ensure the safety and quality of the ingredients and finished product throughout the entire process.

Staff shall be trained to work tidily and operate a "clean as you go" regime.

9.1 Floors

9.1.1 The design of the floors shall permit easy cleaning and junctions between floors and walls shall be rounded and continuous.

9.1.2 The floors shall be smooth and free from cracks including open joints. They shall have adequate drainage slopes to direct any water towards drainage channels. There shall be no back flow from the drainage to the production areas.

9.2 Walls, doors and windows

9.2.1 All walls shall be impermeable, smooth, and easy to clean. All finishes shall be properly applied and maintained. Painted surfaces shall not be allowed to deteriorate or flake. Paint used shall be designed for food production areas. Tiles if used shall be sound and in good repair. Loose or damaged tiles are unacceptable.

9.2.2 Mesh screens shall be put on all windows to avoid insects. Glass shall not be used on the windows in the production areas, only shutter-proof materials are required.

9.2.3 The doors opening from the production areas to the outside shall have self locking devices to ensure doors remain closed at all times. Hanging strip doors shall cover the doors opening from the production to the outside, to avoid entry of dust or insects when the doors opened. The doors shall be sealed at the bottom completely to avoid entry of insects to the production areas. Rubber may be used or any suitable material.

The walls, doors and windows shall be cleaned regularly.

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9.3 Ceilings and overhead structures

9.3.1 The ceilings should have a smooth, impermeable surface kept in good repair. They shall be regularly cleaned and the joints shall be sealed.

9.3.2 The number of overhead structures shall be minimized in production. If required, they shall be of a circular cross-section to aid cleaning and shall be frequently inspected.

9.4 Potability of water

9.4.1 The water used for cleaning or rinsing shall be of good quality and its microbiological suitability shall be checked regularly, at least twice a year.

9.5 Factory perimeters

9.5.1 Outside areas shall be maintained in a sound condition with adequate drainage. Areas shall be kept clean and tidy at all times and debris, old equipment, pallets etc shall not be allowed to accumulate.

9.5.2 Rubbish bins shall be covered, emptied regularly, and maintained in a clean condition.

10 Good Manufacturing Practices

10.2 Management of personnel health and hygiene

10.2.1 Personnel health

10.2.1.1 Plant management shall ensure that that any person afflicted with infected wounds, sores, or any illness, notably diarrhoea, immediately report to management.

10.2.1.2 Management shall take reasonable measures to ensure that a person (including any visitor or contractor) who is:

- infected with, or carrier of , an infectious disease in a communicable form and is likely to be transmitted through food; or
- suffering from acute respiratory infection; or
- suffering from boils, sores, infected wounds, or any other condition that cannot be adequately prevented from becoming source of contamination;

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- Permitted to work in any area of a food plant in a capacity in which there is a likelihood of such person contaminating food or food contact surfaces with pathogenic organisms.

10.2.2 Personnel hygiene and personal hygiene standards

10.2.2.1 Plant management shall ensure that everyone entering the production area present himself or herself in a clean and tidy manner and maintain a high standard of personal hygiene.

10.2.2.2 With respect to the personal hygiene standards the following issues shall be noted.

a) All personnel are expected to bathe daily before entering the factory so as to avoid body odour.

b) All personnel who enter any processing or packing areas must wear suitable clean protective clothing and foot wear. Protective clothing (e.g. coats, overalls, aprons) must be visibly clean at the start of each day's operation

b) Fingernails shall be short and clean. False nails shall be not permitted.

c) The excessive use of cosmetics for example, perfume, aftershave and make up shall not be allowed. False eyelashes shall not be worn.

d) No jewellery except a plain wedding band may be worn provided they cannot be easily dislodged and can be effectively cleaned in the same manner as hands. Wristwatches and cufflinks shall not be worn.

e) Personal items such as purses, handbags etc shall not be allowed in production and packing areas. Suitable and approved secure storage shall be provided.

f) All sores, cuts, grazes, infected areas and other wounds shall be covered by a suitably coloured waterproof dressing, incorporating a metal strip, by the company and applied by the company medical representative who is responsible for providing first aid.

g) Any dressing applied shall be accounted for at the end of the shift. The loss of any dressing shall be reported immediately to the management. Where possible, dressings shall be covered by rubber gloves. Staff arriving at work with an unprescribed wound dressing shall have it checked and, if, necessary replaced.

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h) The personnel responsible for Quality Assurance shall check personnel hygiene daily and record. Anyone not complying with the regulations on personnel should be requested to leave production areas.

10.2.2.3 Medical facilities shall have the following characteristics.

a) A medical room staffed by a trained nurse is desirable, but if there is no trained nurse, then, there shall be a minimum of one trained person in first aid, in any group, on site at any time.

b) Basic first aid facilities shall be available to all the working areas and these shall be agreed on by the Company Medical Advisor. All treatment shall be documented.

c) All personnel shall be made aware of their responsibility for health and safety. Each person shall have a certificate from health authorities that permit him/her to work in a food-processing establishment.

10.2.2.4 In handling of accidents or illnesses the following shall be observed.

a) All accidents at work, no matter how minor, shall be reported.

b) In case of cuts leading to bleeding, blue waterproof plasters, with a strip, shall be issued by the first aid supervisor to the individual. Checks shall be done at the end of the shift so that the plaster is still in place on the individual and has not been lost. If the plaster is lost after being issued then all the product packed that day shall be put under quarantine unless the plaster is found.

c) In case the bleeding has affected the product, the entire product shall be rejected. The working area and equipment shall be cleaned thoroughly and disinfected.

10.3 Management of hygienic operating practices

10.3.1 All operators must establish and carry out procedures to

- Ensure appropriate and adequate maintenance, cleaning, and sanitation of processing premises, facilities, essential services, and equipment;
- Manage waste; and
- Control pests.

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10.3.2 Pre-season cleaning and maintenance check for extraction premises

10.3.2.1 Before the start of each extraction season, a complete and thorough cleaning of the extraction premises, facilities and equipment must be carried out. All facilities, essential services (e.g. water, power) and equipment must be checked to ensure that they are in good working order ready for operation to commence. A record that these tasks have been completed must be kept by the operator

10.3.2.2 All materials and items that may have been stored in the hot room or store room, and extraction room during the off-season that are not necessary for the extraction operation must be removed from the rooms.

10.3.2.3 Walls, floor, ceiling, windows, doors, light fixtures, sinks, fans and other fixtures must be cleaned with suitable cleaning agents so that they are visibly clean and free of honey and bee product residues, dirt, dust, moulds, insect parts and waste, and other debris. The condition of the floor and walls should be checked. They may need to be resealed.

10.3.2.4 All product contact surfaces, including equipment, containers and other implements, must be washed with a suitable detergent, sanitized, rinsed, drained and allowed to dry.

10.3.2.5 External areas surrounding the buildings and access ways must be cleaned and tidied. They must be free from any evidence of pest infestation or accumulated waste.

10.3.3 Cleaning during operations in the extraction, processing and packing

10.3.3.1 Wet cloths may be used for the ongoing wiping of external surfaces of equipment to remove honey residue. The cloths must be maintained in a clean and sound condition. Water contained in buckets for rinsing wiping cloths must be replaced often. Wiping cloths must not be used for wiping contaminated surfaces such as the floor. They must be washed with detergent and sanitized daily.

Wiping cloths should be sanitized by soaking in an approved sanitizer or in chlorinated water.

10.3.3.2 Honey spills on the processing floor must be cleaned up immediately. Spilt honey must not be used for human consumption. Provided it is not contaminated with any chemical substance, spilt honey may be used for animal

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consumption. Any contaminated honey must be clearly identified as “Not Intended for Human Consumption”.

10.3.3.3 Waste must be collected in identified waste containers and must not be allowed to accumulate where it can contaminate any edible honey product or product contact surfaces.

10.3.4 Cleaning at end of day in the extraction, processing and packing areas

10.3.4.1 Products, packaging material and other materials that may be contaminated during wash down must be removed from the area and stored in appropriate locations, or they must be protected by covering them.

10.3.4.2 Waste collected during the day must be removed from the area and disposed of appropriately in designated waste bins.

10.3.4.3 Floors must be cleaned by hosing or other effective means. Water must be drained or removed completely.

10.3.4.4 Visible contamination on walls must be removed by hosing, wiping with clean wet cloths or by other effective means.

10.3.4.5 External surfaces of all equipment must be cleaned so they are visibly clean and free of honey, dirt, dust, moulds, insect parts and waste, and other debris. External surfaces of equipment are generally wiped clean with wet cloths, or hosed down as necessary.

10.3.4.6 Dead and live bees must be removed from the extraction, processing, and packing rooms.

10.3.5 Cleaning of storage areas

10.3.5.1 Packed products, raw materials, packaging and other materials must be stacked and stored in a tidy manner. Adequate space must be available to allow effective cleaning in the storage area.

10.3.6.1 Use of Sanitizers

During cleaning, detergents and disinfectants shall be used appropriately. The manufacturers usually indicate instructions for usage of the sanitizer on the label. These shall be translated for use by the workers. Cleaning schedules and use of sanitizers shall be established and should be specific to all areas, surfaces and equipment.

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10.4 Management of pests and toxic substances

10.4.1 Buildings and storage facilities (including water storage tanks) must be kept in good repair and condition to prevent pest access and to eliminate potential breeding sites.

10.4.2 Holes, drains and other places where pests are likely to gain access must be kept sealed, or provided with screens or similar materials that prevent the entry of pests.

10.4.3 External doors that are not screened must be kept clean and tidy. The external environment must be checked regularly and kept free of any food source and breeding sites (e.g. long grass, bird's nest)

10.4.2 Pest control is not just the control of rodents, flies, and birds. It includes all living creatures whether walking, crawling or flying which contaminate the product or environment.

10.5. ` Use of pesticides

10.5.1 Pest control chemicals (rodenicides and insecticides) shall be handled, used and stored properly

10.5.2 Insecticides that have any residual activity or are dispensed as continuous aerosols shall not be used in any processing or storage area in a manner that could cause the contamination of edible bee product or product contact surfaces.

10.5.3.3 Honey and exposed packaging material shall be removed from the area or kept protected (e.g. covered) prior to the use of chemicals which may result to their contamination. Equipment and other product contact surfaces shall be cleaned by thorough washing after exposure to any chemical (i.e. after spraying with insecticide is completed).

10.5.4 Use of pest traps

10.5.4.1 Pest traps (including rodent boxes, bait stations and electric insect traps) shall be located where they do not present a risk of contamination to the product.

10.5.4.2 Bait stations shall not be located inside any processing area. The location of pest traps should be identified on a site or building plan, or other suitable record.

10.5.4.3 Rodenticides shall be used only in enclosed bait boxes.

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10.5.4.4 Bait stations shall be checked regularly for the following:

• correct location as indicated in the plan or record, and presence of bait. The box should be cleaned and rebaited with an approved rodent bait, as necessary;
• evidence of pest activity (e.g. nibbled bait, bait missing, droppings); and
• boxes are in good working condition and numbering is easily legible.

10.5.4.5 Insect traps, which include ultra-violet lamps, pheromone traps and any form of attractant device, shall:

• be constructed so they catch and secure insects in a suitable drawer, tray or adhesive mat which facilitates the capture and removal of insects;
• not cause any air-borne contamination; and
• be sited so there is no contamination from insects falling on to edible honey product, packaging, or product contact surfaces.

10.5.5 Handling and disposition of contaminated materials

Where there is evidence of contamination from pests (excluding bees), the following actions shall be carried out:

- the affected product shall be considered unfit for human consumption;
- The affected product contact surfaces shall be cleaned and sanitized prior to reuse; and
- Affected packaging materials that cannot be effectively cleaned and sanitized shall not be used for packing of any edible bee product.

10.6 Monitoring

Ongoing compliance to documented procedures, and the effectiveness of the pest control programme shall be regularly checked by the responsible person.

11 Operating practices, raw materials and production requirements

11.1 Inspection and sorting

Prior to introduction into the processing line, or at a convenient point within it, raw materials shall be inspected, sorted or culled as required to remove unfit materials. Such operations shall be carried out in a clean and sanitary manner. Only clean, sound materials shall be used in further processing.

11.2 Washing or other preparation

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Equipment used in the processing of honey shall be washed and dried, Water used for such purposes shall not be re-circulated unless suitably treated to maintain it in a condition as shall not constitute a public health hazard. Water used for washing, shall be of drinking water quality.

11.3 Preparation and processing

Preparatory operations leading to the finished product and the packaging operations shall be so timed as to permit expeditious handling of consecutive units in production under conditions which would prevent contamination, deterioration, spoilage, or the development of infectious or toxigenic microorganisms.

12.0 Packaging and storage

12.1 Packaging material

The material used shall not affect the finished product. .It shall be determined by the operator to be suitable for use, based on an analysis of hazard and other risk factors from the packaging.

12.1.2 Metal drums

All metal drums, including new, reused and reconditioned drums, shall be coated or lined with a food grade lacquered coating. The coating must:

- provide a barrier between the metal surface of the drum and honey;
- be inert;
- not impart any flavour to honey;
- be resistant to delamination, flaking or peeling.

The lining coatings of any drum used for honey (ie, reconditioned or re-used) and the standards they comply with shall be known.
A specification or letter confirming the suitability of the lining should be provided by the drum supplier

12.1.2.1 Reused or reconditioned drums

a. Drums that have been used to contain non-food materials (e.g. petroleum products and other chemicals) shall not be reused for honey.

b. Reused drums that have contained other foods such as sucrose, glucose, or orange juice shall be thoroughly washed and dried, in such a manner as to remove all residues of the food material, before it is used for honey. Only hot water and washing agents that

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have been approved as being safe for food use shall be used. Once cleaned, the drums shall be rinsed with a 1% solution of ########.

12.1.2.2 Inspection of drums

a. Drums shall be checked for damage, deterioration and contaminants prior to use to ensure that they are suitable for containing honey.

b. The internal surface of drums shall have no cracks, rust, delaminated coatings, and other defects or damage that may impact on the safety and suitability of honey. (For closed-head drums, it is common industry practice to use a torch to view the inside of the drum. A mirror should be used to check underneath the lid).

c. Badly dented drums shall not be used.

d. Drums that contain residues of fermented honey shall be washed and dried before reuse.

12.1.2.3 Storage and handling of drums

a. Empty and full drums shall be stored in a manner that prevents deterioration of the drums, and the entry of water and contaminants into the drums. (Empty and full drums should be stored off the ground e.g. use pallets).

b. Drums shall have properly fitted bungs that prevent the entry of moisture and other contaminants.

c. Drums shall be handled and transported in such a manner that prevents dents and other forms of damage.

12.1.2.3 Washing and drying of drums

a. drinking quality water shall be used for washing of drums.

b. Drums shall be completely dried after washing and before being sealed with a `bung. To facilitate drying, washed drums may be dried in hot boxes or rooms. Some processors use hot air guns to dry drums after washing.

12.1.3 Plastic packaging

12.1.3.1 Plastics for food contact use shall be food grade

12.1.3.2 Packaging materials must be adequately protected during transport to the premises and during storage, against dust, pest and other contaminants, and physical damage.

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12.1.4 Glass jars

12.1.4.1 Metals lids must be coated or lined with a food grade material suitable for an acidic food such as honey.

12.1.4.2 Glass jars must be adequately protected during transport to the premises and during storage, against dust, pest and other contaminants, and physical damage. Glass jars should be stored in an inverted position.

12.1.4.3 Glass jars must be handled in manner that does not cause any breakage or other damage.

12.1.4.4 Broken glass must be removed and discarded immediately. A thorough check must be carried out to ensure that all broken pieces are removed.

12.2. Techniques

Packaging shall be done under conditions that preclude the introduction of contamination into the product.

12.2.1 Preservation of finished product

12.2.1 Methods of preservation or treatment of the finished product shall be such as to kill any insects or mites remaining after processing and to result in protection against contamination, deterioration, or development of a public health hazard.

12.2.2 The finished product shall be of such moisture content that is acceptable as stated in Standard for honey NIS473:

12.2.3 In addition to applicable drying, the finished product may be heat processed and shall be packed in hermetically sealed containers so that the product shall remain safe and shall not spoil under normal non-refrigerated storage conditions.

13 Storage and transport of finished products.

13.1 The finished products shall be stored and transported under such conditions as shall preclude the contamination with or development of pathogenic or toxicogenic microorganisms and protect against rodent and insect infestation and deterioration of the product or of the container.

13.2 The product shall be stored under suitable conditions of time, temperature, humidity, and atmosphere, to prevent significant deterioration.

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13.3 Where honey is stored under conditions in which they may become infested by insects and mites, appropriate methods of protection shall be used regularly.

14 Laboratory control procedures

it is desirable that each plant in its own interest should have its own or access to laboratory control of the sanitary quality of the products processed. Such control should reject the products that are unfit for human consumption. Analytical procedures shall be clearly defined and documented.

14.2 Tests should be carried out to ensure the product is free of unauthorized veterinary drugs and pesticides and authorized veterinary drugs above the relevant Maximum Residue Limit.

13.1 End product specifications

Appropriate methods shall be used for sampling, analysis, and determination in the following specifications:

a) to the extent possible in good manufacturing practice the products shall be free from objectionable matter;

b) the products shall not contain any pathogenic microorganisms or any toxic substance originating from microorganisms; and

c) the products shall comply with the requirements on Pesticide Residues and Food Additives as contained in permitted lists or Codex commodity standards.

14 Record keeping

14.1 Records shall be available and be supplied on demand as evidence to establish food safety. These records shall be legible, permanent, accurate and be signed and dated by the individual(s) responsible.

14.2 They should include procedures, controls, limits, and subsequent follow-up documents. They shall be retained for at least one year after the expiration of the durable life date (best before date) or, at least two years after the food has been released to the consumer.

14.3 The records shall include where applicable:
a) raw material quality control record;
b) grower/supplier agreements;
c) drying control record (where applicable);

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d) stock control record;
e) company induction for all staff;
f) training programme;
g) daily personnel check list;
h) sanitation record;
i) water analysis checks;
j) k) glass control record;
I) accident and illnesses record;
m) rodent control record;
n) chemicals records (additives, sanitizers);
o) insects control record;
p) foreign matter control record;
q) finished product control record, lots records including distribution; and
r) consumer complaints register.

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