Code of Practice : Honey : Processing Facilities

Standard : Honey

Code of Practice : Honey : Processing and Packaging

Price Group:

SON

ICS XX: XXX

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FOREWORD

Honey is one of Nigerian agro-based products that are emerging in the International markets, and its production is on the increase. Many potentially health hazardous situations can arise from unwholesome practices during the production of honey.

This code of practice therefore provides guidelines for honey producers/suppliers in order to ensure that honey production (processing and packaging) meets national and international requirements.

The Technical Committee on water, non-alcoholic drinks, honey and other beverages, prepared this Code of Hygienic Practice and in preparing the Code, references were made to relevant International Standards and industry practices, all of which are hereby acknowledged.

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1. SCOPE

This Nigerian code of practice prescribes general hygienic practices for use in the Processing of honey. It covers requirements and recommendations for processing and packaging facilities of honey intended for human consumption in order to ensure a safe, sound and wholesome product. It does not include good hygienic practice for honey harvesting, handing, storage and transportation.

2. NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this code of practice. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies**.[use updated chapeau clause**

2.1 NIS 473:2003:Nigerian Industrial Standard for Honey

2.2 CAC-1-1969,Rev 4-2003 Codex Alimentarus Commission/Recommended Code of Practice-General Principle Of Food Hygiene.

2.3 NIS 544:2015 Nigerian Industrial Standard for Drinking Water Quality

2.4 NIS 306:2008:Nigerian Standard for Potable Water

3. TERMINOLOGY

For the purpose of this Code of Hygienic Practice, the following terms and all the terminologies in Nigerian Industrial Standard for Honey- NIS 473:2003 apply:

3.1 adequate: sufficient to accomplish the intended purpose of this Nigerian Code of Practice.

3.2 cleaning: the removal of soil, honey residue, dirt, grease or other objectionable matter.

3.3 contaminant: any biological or chemical agent, foreign matter, or other substance not intentionally added to the product which may compromise food safety or suitability.

3.4 contamination: the occurrence of any objectionable matter in the product.

3.5 disinfection: the reduction, without adversely affecting the honey, by use of hygienically satisfactory chemical agents and/or physical methods of the number of microorganisms to a level that will not lead to harmful contamination of honey.

3.6 establishment: any building(s) or area(s) in which honey is handled after harvesting and the surrounding under the control of the same management**.**

3.7 honey: natural sweet substance produced by honey bees from the nectar of plants or from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in the honey comb to ripen and mature and complies with the specifications for Nigerian Industrial Standard for Honey (NIS**473:2003**).

3.8 raw honey: is honey as it exists in the beehive or as obtained by extraction, settling or straining, without adding heat.

3.9 blossom honey: is the honey which comes from the nectar of flowers. It is also called nectar honey.

3.10 pasteurized honey: is honey that has been heated in a pasteurization process (161^{o}f (71.7^{o}c) or higher).

3.11honeydew: is honey which comes mainly from excretions of plant sucking insects *(*Hemiptera*)* on the living parts of plants or secretions of living plants.

3.12comb honey: is honey stored by bees in the cells of freshly built brood less combs and which is sold in sealed whole combs or sections of such combs.

3.13 filtered honey: is honey of any type that has been filtered to the extent that all or most of the fine particles, pollen grains, air bubbles or other materials normally found in suspension ,have been removed.

3.14 crystallized honey: is honey in which some of the glucose content has spontaneously crystallized from solution as monohydrate. It is also called granulated honey or candied honey.

3.15 dried honey: is honey with the moisture extracted to create completely solid, nonstick granules.

3.16 pressed honey: is honey obtained by pressing brood less combs.

3.17honey handling: any operation in the production and harvesting, preparation, processing, packaging, storage, transport, distribution and sale of honey.

3.18 honey hygiene –all measures necessary to ensure a safe, good quality and wholesome honey product at all stages from its harvest, extraction or manufacture until final honey sale.

3.19 packaging material –any container such as cans, bottles, cartons, boxes, cases and sacks or wrapping and covering material such as foil, film, metal, paper, wax-paper and cloth used to package the honey.

3.20 pest –any animal capable of directly or indirectly contaminating honey

3.21portable water – water that is suitable for human consumption and complies with Nigerian Industrial Standard for Drinking Water Quality Specifications (NIS 544:2015) or Nigerian Standard for Portable Water (NIS 306:2008).

HYGIENE REQUIREMENTS IN HONEY PROCESSING AREA

4. Establishment: Design and Facility.

In addition to relevant provisions in the Recommended International Code of Practice - General Principles of Food Hygiene, (CAC/RCP 1-1969, Rev.2003), the following shall apply:

4.1 Establishment

4.1.1. During harvest the honey processing area shall be exclusively for extraction, processing, and packaging or handling of honey and for the storage of related equipment. Good Hygienic Practices shall be maintained.

4.2 Locations

Establishment should be located in areas which are free from objectionable odour, smoke, dust or other contamination and are not subject to flood.

4.3 Roadways and areas used by wheeled traffic

4.3.1 Roadways and areas serving the establishment which are within its boundaries should have a surface suitable for wheeled traffic. There should be adequate drainage.

4.4 Buildings and Facilities

4.4.1 Buildings and facilities should be soundly constructed and maintained in good repair.

4.4.2 Adequate working space should be provided to allow for satisfactory performance of all operations**.**

4.4.3 The design shall be such as to permit easy and adequate cleaning**.**

4.4.4 The building and facilities shall be designed to prevent the entrance and harboring of pests and the entry of environmental contaminants such as smoke and dust etc.

4.4.5 Buildings and facilities shall be designed to provide separation, by partition, location or other effective means between those operations which may cause cross contamination.

4.4.6 Buildings and facilities shall be designed to facilitate hygienic operations by means of a regulated flow in the process from the arrival of the honey at the premises to the finished product, and shall provide for adequate temperature conditions for the process and the product.

4.5 In honey handling areas:

4.5.1 **Floors** should be water proof, washable, easy to clean and disinfect. Where appropriate, floors should be sloped sufficiently for liquids to drain to trapped outlets.

4.5.2 **Walls** should be of washable and of non-toxic materials, light colored and should be easy to clean and disinfect.

4.5.3 **Ceilings and overhead structures** should be so designed, installed, constructed and finished as to prevent the accumulation of dirt and minimize condensation, mould development and flaking and should be easy to clean**.**

4.5.4 **Windows and other openings** should be constructed as to avoid accumulation of dirt and those which open should be fitted with screens. Screens should be easily movable for cleaning and kept in good repair.

4.5.5 **Doors** should have smooth, non- absorbent surfaces and, where appropriate, be self - closing and close fitting.

4.5.6 **Stairs, lift cages and auxiliary structures** such as platforms, ladders, chutes, should be so situated and constructed as not to cause contamination to the honey. Chutes should be constructed with inspection and cleaning hatches.

4.5.7 **Living quarters, toilets** and areas where animals are kept shall be completely separated from and shall not open directly onto extracting or processing areas.

4.5.8 The use of material which cannot be adequately cleaned and disinfected should be avoided unless its use would clearly not be a source of contamination to the honey**.**

4.6 Sanitary Facilities

4.6.1 Water Supply:

4.6.1.1 An ample supply of **potable water** under adequate pressure shall be available and with adequate protection against contamination.

4.6.1.2 **Steam** used in direct contact with honey or honey contact surfaces shall contain no substances which may be hazardous or may contaminate the honey.

4.6.1.3 **Non potable water** used for steam production shall be carried in completely separate lines, preferably coloured to differentiate function of water and prevent cross contamination.

4.6.2 Effluent and waste disposal

Establishments shall have an efficient effluent and waste disposal system which should at all times be maintained in good order and repair.

4.6.3 Toilet facilities

Adequate, suitable and conveniently located toilets shall be provided in or for all establishments. Hand washing facilities with warm or hot and cold water, a suitable hand cleaning preparation, with suitable hygienic means of drying hands shall be provided.

4.6.4 Cleaning facilities in processing areas.

Adequate cleaning facilities for cleaning working implements and equipment shall be provided.

4.6.5 Lighting.

Adequate natural or artificial lighting should be provided throughout the establishment. Light bulbs and fixtures suspended over honey materials in any stage production should be of a safe type and protected to prevent contamination of honey in case of breakage.

4.6.6 Ventilation

Adequate ventilation shall be provided to prevent excessive heat, steam condensation and dust and to remove contaminated air. The direction of the air flow shall not be from a dirty area to a clean area. Ventilation openings should be provided with a screen or other protecting enclosure of non- corrodible material.

4.7 Equipment and Utensils

4.7.1 Materials

All equipment and utensils used in honey handling areas and which may have contact with honey shall be made of material which does not transmit toxic substances, odour or taste, is non –absorbent and is resistant to corrosion. Where necessary, equipment and utensil should be durable and movable or capable of being disassembled to allow for maintenance, cleaning, disinfection, monitoring and for example to facilitate inspection for pest.

4.7.2 Sanitary Design, Construction and Installation.

Equipment and Utensils should be designed and constructed as to prevent hygienic hazards and permit easy and through cleaning and disinfection and, where practicable be visible for inspection. Stationary equipment should be installed in such a manner as to permit easy access and thorough cleaning.

4.7.3Equipment Identification

Equipment and utensils used for inedible materials or waste shall be so identified and shall not be used for edible products.

5. Establishment: hygiene requirements

In addition to relevant provisions in the Recommended International Code of Practice - General Principles of Food Hygiene, (CAC/RCP 1-1969, Rev.2003), the following shall apply:

5.1 Maintenance

The buildings, equipment, utensils and all other physical facilities of the establishment, including drains, should be maintained in good repair and in orderly condition. As far as practicable, rooms should be kept free from steam, vapour and surplus water.

5.2 Cleaning

5.2.1 Floors, including drains, auxiliary structures and walls of honey handling areas should be thoroughly cleaned immediately after cessation of work for the day or at such other times as may be appropriate.

5.2.2 Periodic cleaning of packaging equipment should be carried out as required.

5.3 Exclusion of Domestic Animals

Animals shall be excluded from the establishment.

5.4 Pest Control

5.4.1 There should be an effective and continuous program for control of pest. Establishments and surrounding areas should be regularly examined for evidence of infestation.

5.4.2 Pesticides shall be used when other precautionary measures are not effective. Before pesticides are applied, care should be taken to safeguard all honey, bees, hives, equipment and utensils from contamination. After application, contaminated equipment and utensils should be thoroughly cleaned to remove residues prior to being used again.

5.4.3 Buildings should be kept in good repair and condition to prevent pest access and to eliminate potential breeding sites. Holes, drains and other places where pests are likely to gain access should be kept sealed.

5.5 Storage of Hazardous Substances

5.5.1 Pesticides or other substances which may represent a hazard to health and the honey producing bees, they shall be suitably labeled with a warning about their toxicity and use. Extreme care shall be taken to avoid contaminating honey.

5.5.2 No substance which could contaminate honey shall be used or stored in extracting or processing area.

5.6 Waste Management

Suitable provision should be made for the removal and storage of waste. Waste should not be allowed to accumulate in honey handling, storage and other work areas and the adjoining environment. Waste stores or area shall be kept appropriately clean.

6. Personnel Hygiene

6.1 Illness and Injuries

People known or suspected to be suffering from, or to be carrier of a disease or illness likely to be transmitted through food, should not be allowed to enter the honey handling or processing area. Any person who has a cut or wound should not continue to handle honey or honey contact surfaces until the injury is completely protected.

6.2 Personnel Cleanliness

Every person engaged in an extracting and/or processing area should maintain a high degree of personnel cleanliness and should wear adequate clothing. Personnel should not wear any insecure jewellery when engaged in honey handling. Head covering should be used in the consumer packaging area while packing honey. Personnel should always wash their hands when personal cleanliness may affect food safety.

6.3 Personal Behavior

Any behavior which could result in contamination of honey, such as eating ,use of tobacco, chewing(e.g. gum, sticks etc.),wearing of excessive amounts of perfume or unhygienic practices such as spitting, should be prohibited in extracting and/or processing area.

6.4 Visitors

Visitors to honey processing, packaging or handling areas should, where appropriate, wear protective clothing and adhere to personal hygiene instructions to prevent contamination of honey.

7. Establishment: hygiene requirements for processing

In addition to relevant provisions in the Recommended International Code of Practice - General Principles of Food Hygiene, (CAC/RCP 1-1969, Rev.2003), the following shall apply:

7.1 Bulk Honey Requirements

7.1.1 Bulk honey stored on the premises of the establishment should be maintained under conditions that will prevent spoilage, protect against contamination and minimize damage. Stocks of bulk honey should be properly rotated.

7.2 Processing

7.2.1 All steps in the production process, including packaging, should be performed without unnecessary delay and under conditions which will prevent the possibility of contamination or deterioration.

7.2.2 Processing shall be conducted according to acceptable honey manufacturing practices to ensure compliance with regulatory requirements.

7.2.3 Handling procedures

Any honey on the floor is contaminated and shall not be introduced to the production line.

7.3 Packaging

7.3.1 The packaging material should be sound and provide adequate protection from contamination.

7.3.2 Packing should be done under conditions that preclude the introduction of contamination into the product.

7.3.3 Honey should be labeled by case lot numbers for consumer containers.

8 Training

8.1 Awareness and Responsibilities

Honey handlers shall have the necessary knowledge and skills to enable them to handle honey hygienically.

8.2 Training Programmes

Factors to take into account in assessing the level of training required include

- The nature of the honey, in particular its ability to sustain growth of pathogenic or spoilage micro-organisms
- The manner in which the honey is handled and packed, including the probability of contamination;
- The extent and nature of processing or further preparation before final consumption;
- The conditions under which the honey is stored; and
- The expected length of time before consumption

8.3 Instruction and Supervision

Periodic assessments of the effectiveness of training and instruction programmes should be made, as well as routine supervision and cheeks to ensure that procedures are being carried out effectively.

Managers and supervisors of honey processes should have the necessary knowledge of food hygiene principles and practices to be able to judge potential risks and take the necessary action to remedy deficiencies.

8.4 Refresher Training

Training programmes should be routinely reviewed and updated where necessary. Systems should be in place to ensure that honey handlers remain aware of all procedures necessary to maintain the safety and suitability of honey.

9. Application of HACCP System

HACCP system should be in place to enhance food safety, aid inspection by regulatory authorities and promote international trade by increasing confidence in food safety. See Annex A for guidance.

Bibliography:

1. Code of Good Manufacturing Practices - General Principles for Honey (Canada)
2. Essiet Daniel. “The Bitter Side of Honey Production”. The Nation Newspaper 9 Feb, 2015. thenationonlineng.net.19 Nov,2015

ANNEX A

A. APPLICATION OF HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) SYSTEMS IN HONEY PRODUCTION

The hazard analysis and critical control point (HACCP) system is a scientific, rational and systematic approach to identification, assessment and control of hazards, during collection, processing, bottling/packaging and marketing of the honey to ensure that its safe when consumed.(I.e. it does not present any risk to health).

The application of HACCP principles consist of the following tasks.

A.1 HACCP Team

The operation shall assure that the appropriate product specific knowledge and expertise is available for the development of an effective HACCP plan. Where such expertise is not available on site, expert advice should be obtained from other sources. The scope of the HACCP plan should be identified. The scope shall describe which segment of the food chain is involved and the general classes of hazards to be addressed (e.g. does it cover all classes of hazards or only selected classes.)

A.2 Description of product

A full description of the product shall be drawn up, including relevant safety information such as physical/chemical structure, microbial/treatments, packaging, durability and storage condition and method of distribution.

A.3 IDENTIFICATION OF INTENDED USE

The intended use shall be based on the expected uses of the product by the end user or consumer.

A.4 CONSTRUCTION OF FLOW DIAGRAM

The HACCP team shall construct the flow diagram. The flow diagram shall cover all steps in the operation. When applying HACCP to a given operation consideration should be given to steps preceding and following the specified operation.

A.5 ON-SITE CONFIRMATION OF FLOW DIAGRAM

The HACCP team shall confirm the processing operation against the flow diagram during all stages and hours of operation and amend the flow diagram where appropriate.

A.6 LISTING ALL POTENTIAL HAZARDS ASSOCIATED WITH EACH STEP, CONDUCTING A HAZARD ANALYSIS AND CONSIDERING MEASURES TO CONTROL IDENTIFIED HAZARDS.

The HACCP team shall list all of the hazards that may be reasonably expected to occur at each step from primary production, processing and distribution until the point of consumption.

The HACCP team shall next conducted a hazard analysis to identify for the HACCP plan which hazards are of such a nature that their elimination or reduction to acceptable level is essential to the production of a safe product.

In conducting the hazard analysis wherever possible the following should be included:

- The likely occurrence of hazards and severity of their adverse health effects
- The qualitative and /or quantitative evaluation of the presence of hazards

- Survival or multiplication of microorganisms of concern
- Production or persistence in water of toxins, chemicals or physical agents and
- Condition leading to above.

The team must then consider what control measures, if any exist which can be applied for each hazard.

A.7 DETERMINATION OF CRITICAL CONTROL POINTS

There may be more than one critical control point (CCP) at which control is applied to address the same hazard. The determination of a CCP in the HACCP system can be facilitated by the application of a decision tree should be flexible, given whether the operation is for collection, processing, storage and distribution. It should be use for guidance when determining CCPs. This example of the decision tree may not be applicable to all situations. Other approaches may be used. Training in the application of the decision tree is recommended.

If a hazard has been identified at a step where control is necessary for safety and no control measures exist at that step or at any earlier or later stage to include a control measures.

A.8 ESTABLISHING CRITICAL LIMITS FOR EACH CCP

Critical limits must be specified and validated if possible for each critical control point. In some cases more than one critical limit will be elaborated at a particular step. Criteria often used include measurement of temperature, time, moisture level, pH available chlorine and sensory parameters such as appearance and texture.

A.9 ESTABLISHING MONITORING SYSTEM FOR EACH CCP

Monitoring is the schedule measurement or observation of CCP relatives to its critical limits. The monitoring procedures must be able to detect loss of control at the CCP. Furthermore monitoring should ideally provide this information in time to make adjustments to ensure control of the process to prevent violating the critical

limits. Where possible process adjustments should be made when monitoring result indicate a trend towards loss of control at CCP. The adjustment should be taken before deviation occurs. A designated person with knowledge and authority to carry out corrective actions when indicated must evaluate data derived from monitoring. If monitoring is not continues then the amount of frequency of monitoring must be sufficient to guarantee the CCP is in control. Most monitoring procedures of CCPs will need to be done rapidly because they to online processes and there will not be time for lengthy analytical testing. Physical and chemical measures are often preferred to microbiological testing because they may be done rapidly and can often indicate the microbiological control of product. All records and documents associated with monitoring CCPs must be signed by the person doing the monitoring and by responsible reviewing official of the company.

A.10 ESTABLISHING CORRECTIVE ACTIONS

Specific corrective actions must be developed for each CCP in the HACCP system in order to deal with the deviations when they occur.

The actions must ensure that the CCP has been brought under control. Actions taken must also include proper disposition of the affected product. Deviation and product disposition procedures must be documented in the HACCP record keeping.

A.11 ESTABLISHING VERIFICATION PROCEDURES

Establish procedures for verification, verification and auditing methods, procedures and tests, including random sampling and analysis can be used to determine if the HACCP system is working correctly. The frequency of verification should be sufficient to confirm that the HACCP system is working effectively.

Examples of verification activities include:

- Review of the HACCP system and its records
- Review of deviations and product disposition
- Confirmation that CCPs are kept under control.

Where possible, validation activities should include actions to confirm the efficacy of all elements of the HACCP plan.

A.12 ESTABLISHING DOCUMENTATION AND RECORD KEEPING

Efficient and accurate record keeping is essential to the application of HACCP system. HACCP procedures should be documented. Documentation and record keeping should be appropriate to the nature and size of the operation.

Documentation examples

- Hazard analysis
- CCP determination
- Critical limit determination

Record examples are:

- CCP monitoring activities
- Deviation and associated corrective actions
- Modifications to the HACCP system
- An example of HACCP worksheet is attached as appendix 3