PNS/BAFS

PHILIPPINE NATIONAL STANDARD

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Code of Good Hygienic Practice for Milk

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Foreword

This Philippine National Standard (PNS) Code of Hygienic Practice for Milk is based on the Codex Alimentarius Commission *Code of Hygienic Practice for Milk and Milk Products (CAC/RCP 57-2004)* with some modifications to suit the local production practices, and was developed by a Technical Working Group (TWG) organized by the Bureau of Agriculture and Fisheries Standards (BAFS) through a Department of Agriculture (DA) Special Order No. 741, Series of 2016.

The TWG is composed of representatives coming from government agencies such as the National Dairy Authority and the Philippine Carabao Center, academic institutions such as the Central Luzon State University and the University of the Philippines - Los Baños, and the private sector represented by the Dairy Confederation of the Philippines, with BAFS as Secretariat.

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1 Scope

This Code applies to the primary production and post-harvest handling of milk from cattle, buffalo and goat intended for further processing.

2 Objectives

The purpose of this Code is to provide guidance for the hygienic production, collection, and handling of milk, to ensure that the milk is safe and suitable for further processing.

3 Definition of Terms

For the purposes of this standard, the following definitions apply:

3.1
animal holding area
any area where animals are kept before milking

3.2
avoid
to keep away from, to the extent reasonably practicable; in this Code, the term will be used to mean, in theory, to have no contamination or to constrain a particular practice.

3.3
backyard
small hold farm
refers to farms where the number of milking animals per farmer or per herd usually does not exceed a) 5 for cattle and buffalo and b) 10 for goats, milking machines are not generally used, milk is not used at the producer's level and/or the milk is transported in milk cans. The terms may be used interchangeably.

3.4
contaminant
any biological or chemical agent, foreign matter, or other substances not intentionally added to food which may compromise food safety or suitability

3.5
control measure
any action and activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level.

3.6
foremilk
the first three squirts of milk

3.7

intended use

is the purpose for which the product is specifically stated or could reasonably be presumed to be intended having regard to its nature, packaging, presentation and identification

3.8

milk

is the normal mammary secretion of milking animals obtained from one or more milkings without either addition to it or extraction from it, intended for consumption as liquid milk or for further processing.

3.9

milk contact surfaces

all items, including equipment and utensils, used during milking that come into contact with milk e.g. plunger, strainer, etc.

3.10

minimize

to reduce the likelihood of occurrence or the consequence of an unavoidable situation such as microbiological growth.

3.11

shelf life

the period during which the product maintains its microbiological safety and suitability at a specified storage temperature and, where appropriate, specified storage and handling conditions.

3.12

suitability

assurance that milk is acceptable for human consumption according to its intended use; to be found safe, wholesome and sound as it relates to hygiene.

4 Primary Production

a. Contamination of milk from animal and environmental sources during primary production should be minimized.

b. Appropriate animal husbandry practices should be respected and care should be taken to assure that proper health of the milking animals is maintained.

c. Measures should be implemented at the primary production level to reduce the initial load of pathogenic micro-organisms and other micro-organisms affecting safety and suitability to the extent possible to provide for a greater margin of safety and/or to

prepare the milk in a way that permits the application of microbiological control measures.

d. The degree to which on-farm practices control the likelihood of occurrence of food safety hazards in milk will have an impact on the nature of controls needed during the subsequent processing of milk.

4.1 Environmental management, hygiene and sanitation

4.1.1 Water

a. Water and other environmental factors should be managed in a way that minimizes the potential for the transmission, directly or indirectly, of hazards into the milk.

b. There should be an appropriate and adequate supply of water with a quality suitable for its intended purpose, and it should not contribute to the introduction of hazards in milk.

c. Where water is used for the cleaning of the udder and for cleaning milking equipment and milk storage equipment, it should be of such quality that it does not adversely affect the safety and suitability of the milk.

d. Precautions should be adopted to ensure that milking animals do not consume or have access to contaminated water or other environmental contaminants likely to cause diseases transmissible to humans or contaminate milk.

4.1.2 Farm areas and premises

Areas and premises used for milk production should be situated, maintained and, to the extent practicable, used in a manner that minimizes the introduction of hazards into milk.

4.1.2.1 Animal holding areas

a. Animal holding areas should be kept clean and maintained in a manner that minimizes the risk of animal infection or contamination of milk. The occurrence of the following should be prevented:
    - Accumulations of manure, mud, or other objectionable materials, and
    - Presence of other species that would adversely affect the safety of milk.

b. Animal holding areas should be such that animals with contagious diseases can be separated to prevent the transmission of diseases to healthy animals.

c. Litter and stabling area should be maintained in a manner that minimizes the risk of teat injuries and udder diseases.

4.1.2.2 Milking areas and related facilities

a. There should be adequate separation between milking areas and any premises where animals are housed in order to prevent contamination of milk by animals. Where separation is not possible, adequate measures should be taken to ensure that the milk is not contaminated.
For goats, it is recommend that milking areas be positioned at least 50 meters away from and in the opposite wind direction of the buck pens.

b. Premises where milking is performed should be situated, constructed (if applicable) and maintained in a manner that will prevent or minimize contamination of milk. There should be effective separation from all sources of contamination such as lavatories and manure heaps.

c. Immediate removal of manure after milking should be practiced. For goats on elevated milking platform, the area should be designed to allow separation from accumulations of manure.

d. Pigs, poultry and other animals should not be allowed to gain access to the milking are.

e. Milking area should be designed to facilitate ease of cleaning, particularly in areas subject to soiling or contamination.

f. Flooring should be constructed to facilitate draining of liquids and adequate means of disposing waste.

g. There should be adequate ventilation and lighting.

4.1.3 Waste Management

a. Where a farm has a milking herd comprised of more than one species, there must be management considerations that should comply with sanitary conditions for each species.

b. Farm premises should be kept clean and free of potential conditions conducive to breeding of pests, animal parasites and disease outbreak. This is to avoid negative effects on the landscape, environment and animal welfare.

c. Organic materials should be regularly removed from all livestock contact surfaces (i.e., floors, pen partitions). Where bedding is used, it should be regularly replaced.

d. The farm should have a proper and functional drainage system towards a water treatment facility. Solid and liquid waste should be managed and disposed according to existing relevant guidelines imposed by competent authorities.

e. The farm should have a written sanitation program that includes integrated pest management.

f. The farm operator should maintain and display clear instructions on procedure for disposal of farm solid wastes and farm chemical wastes (e.g. expired pesticide/weedicide and containers, paint, etc.)

g. The farm operator should be familiar with the proper procedure for disposal and schedule of actions to be taken, especially at times of emergency.

h. The farm should have proper handling and disposal system for dead animals, and should be in accordance with existing regulations of the competent authority. In the case of burial method, there should be enough space, be in a non-flooding area, and away from water sources. In the case of carcass pit, carcass should be dropped in a specific carcass pit with good hygienic practices.

i. The farm should take appropriate measures to minimize excessive odor coming from the farm and that which may be associated with waste decomposition.

4.1.4 Pest Control

a. The farm should have a written pest management program.

b. Pests should be controlled, and in away that does not result in unacceptable levels of residues, such as pesticides, in the milk. All efforts should be made to minimize the presence of pests before pesticides or rodenticides are used, e.g. proper building construction, maintenance, and cleaning, and avoidance of accumulation of manure.

c. Feed should be kept in containers that provide adequate protection against such pests. Storage bins or compartments should be located at a suitable place.

d. If it is necessary to resort to chemical pest control measures, such products should be approved officially for use in food premises and used in accordance with manufacturer's instructions. Storage of these chemicals should be in a manner that will not contaminate the milking environment, e.g. storing away from wet areas and away from feed storages.

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194 ### 4.1.5 Process Control

195 a. A routine program to verify the adequacy of cleaning and pest control should be in
196 place.
197
198 b. Records should be kept to enhance the ability to verify the effectiveness of the control
199 systems.
200

201 ## 4.2 Animal husbandry and management

202 a. Animals should be raised according to Good Animal Husbandry Practices to reduce
203 the likelihood of introduction of food safety hazards.
204
205 b. Good animal husbandry practice (GAHP) should involve the health and hygiene of
206 animals, records of treatment, feed and feed ingredients, and relevant environmental
207 factors, and should include application of HACCP principles to the greatest extent
208 practicable.

209 ### 4.2.1 Animal identification and Traceability

210
211 a. Animals should be identifiable to facilitate effective herd management practices.

212 b. There should be a system to identify milking animals that would allow traceability.To
213 this effect:
214 • The herd should be registered with the competent;
215 • Each animal should be identified and registered with the competent authorities.
216

217 ### 4.2.2 Animal Health

218 4.2.2.1 Introduction of new animals
219
220 a. New animals should be separated and not mixed with the herd until their health
221 status has been established. During that quarantine period, milk from those animals
222 should not be used for the production of milk for the manufacture of milk products;
223
224 b. The owner should keep a record of relevant information, e.g. vaccination records,
225 results of tests carried out to establish the status of an animal just being introduced,
226 and identity for each animal either coming or leaving the herd.
227
228 4.2.2.2 Management of the milking herd

a. The health status of milking animals and herds should be managed in a manner that addresses the hazards of concern for human health; these include programs and procedures for the:
   - Eradication of animal diseases or control of risk of transmission of the diseases according to the specific zoonosis;
   - Segregation of diseased animals from healthy animals; and
   - Management of new animals introduced into the herd.

b. Milk should come from animals in good health so that, considering the end use, it does not adversely affect the safety and suitability of the end product. Generally, these are animals that:
   - Do not show visible impairment of general health;
   - Are not suffering from any infection of the udder and genital tract with discharge, enteritis with diarrhea, and fever; and
   - Do not show any evidence of infectious diseases transferable to humans through milk, including but not limited to those diseases governed by the OIE Terrestrial Animal Heath Code.

c. Milk from animals that have been treated with veterinary drugs that can be transferred to milk should be discarded appropriately until the withdrawal period of the drug has been achieved.

d. Milk should come from animals that have been tested and are not positive for tuberculosis and brucellosis, and other diseases as prescribed by the competent authority. Testing should be done annually or as prescribed by the competent authority.

e. Maintenance of good udder and teat health is vital; adequate measures should be implemented in order to prevent udder infections, e.g.
   - Proper calibration, use, cleaning and disinfection of milking equipment;
   - Procedures for udder cleaning and disinfection before, during, and after milking;
   - Proper management of animal holding areas; and
   - Proper management of dry and lactation periods.

f. Records of relevant information should be kept, e.g. tests results, animal movement in and out of the herd, treatment records, and animal identification. The farm should keep a record of the veterinary products used, including the quantity, the dates of administrations and the identity of the animals. Milk tests results may also provide information regarding the health status of the animals.

4.2.2.3 Use of veterinary drugs

a. Good husbandry procedures should be used to reduce the likelihood of animal disease and thus reduce the use of veterinary drugs.

b. Animals should only be treated with veterinary drugs authorized by the competent authority for the specific use.

4.2.3 Feeding systems

a. The relevant aspects of feeding management in the PNS Code of Good Animal Husbandry Practice should be applied to minimize or prevent the introduction of contaminants through feed or feeding practices.

b. With consideration given to the end use of the milk, forage and feed for lactating animals should not introduce, directly or indirectly, contaminants into milk in amounts that present an unacceptable health risk to the consumer or adversely affect the suitability of milk or milk products.

c. In cases of feeds that are preserved for future feeding, it is necessary that the feed be prepared, stored and used in a manner that will minimize microbial contamination. Particular attention shall be given to compliance with good practices concerning the following aspects:
   - The design of silos;
   - Good production practices of haylage; and
   - Regular check of the quality of the preserved feed (organoleptic inspection or pH).

d. Only those products, premixes and feed additives that have been authorized by the competent authority for inclusion in animal feed should be used.

e. The farm operator should keep a record of relevant information concerning feed.

f. In cases of farm-mixed feed formulation, farm operators should only use ingredients from authorized and traceable suppliers. Records of purchases should be kept.

g. Procurement documents of feed concentrates should be kept and updated properly and should include:
   - supplier or source of feed concentrate and its registration number;
   - type of feed and supplements;
   - quantity;
   - declaration of ingredients;

- document of feed analysis;
- date of delivery; and
- date of manufacturing and batch number
- expiry date

4.3 Personnel

4.3.1 Health and personal hygiene of milking personnel

a. Milking personnel should be in good health. Persons known or suspected to be suffering from, or to be a carrier of, a disease likely to be transmitted to the milk, should not enter milk handling areas if there is a likelihood of their contaminating the milk. Any person so affected should immediately report illness or symptoms of illness to the management.

b. Facilities for personal hygiene should follow the recommendations found the in the General Principles of Food Hygiene (CAC/RCP 1-1969).

c. Medical examination of a milk handler should be carried out if clinically or epidemiologically indicated.

d. Milk handlers should maintain a high degree of personal cleanliness.

4.3.2 Training

Milk producers and milk handlers involved in the harvesting, collection, and transport of milk should be trained as necessary and have appropriate skills in the areas listed below:

- Hygienic milking;
- Storage, handling, collection and transport of milk (cleaning of storage tanks, temperature requirements, sampling procedures, etc.);
- Microbiological, chemical, and physical hazards and their control measures.
- Disease control and prevention;
- Management and control of mastitis;
- Manufacturing and use of feeds (more specifically preserved feeds); and
- Herd management

5 Hygienic milking

5.1 Milkers and milk handlers

a. Milkers and milk handlers should perform their duties in a hygienic manner so that their activities will not result in contamination of milk.

b. Milk handlers should wear clean clothing. Should clothing and footwear be contaminated with manure, the soiled clothes and footwear should be changed or cleaned before work is continued.

c. Milk handling operations should not be performed by persons at risk of transferring pathogens to milk. Appropriate medical follow-up should be done in the case of an infected worker.

5.2 Milking procedures

a. There should be a mastitis control program in place.

b. Factors to consider in carrying out hygienic milking include but is not limited to:
   - Good personal hygiene of the milking personnel (see Section 5.3.1 on Personal Hygiene) which includes but is not limited to:
     - Proper washing of hands and forearms (up to elbow) before initiating milking or handling of milk, or as necessary;
     - Milking not being performed by persons having exposed abrasions or cuts on their hands or forearms. Any injury on hands or forearms must be covered with a water-resistant bandage;
     - Wearing of suitable clothing, including face mask, hair nets or head caps, during milking and which should be clean at the commencement of each milking period.
   - Good hygiene of the milking area or milk production environment
   - Clean udders, teats, groin, flanks, and abdomens of the animals
   - Clean and disinfected milking vessels/equipment
   - Avoidance of any damage to the tissue of the teat/udder

c. Milking should be carried out in such a manner that minimizes contamination (e.g. manure or dust) of the milk being produced.

d. Animals showing clinical symptoms of disease or those undergoing treatment with veterinary drugs that leave residues in milk should be segregated and/or milked last, or milked by separate milking equipment or by hand, and such milk should not be used for human consumption.

e. The milker should check that the milk and milking animals appear normal through:
   - Careful observation of the condition of milking animals;

- Checking the organoleptic or physicochemical indicators of milk of each animal; and
- Using records and identification of treated animals.

f. Foremilk from each teat should be discarded or extracted separately and not used for human consumption unless it can be shown that it does not affect the safety and suitability of the milk.

g. There should be appropriate precautions to minimize the risk of infections to teats and udders, e.g teat dips.

5.3 Milk contact surfaces and related paraphernalia

a. Equipment selected for installation on dairy farms should meet recognized design and construction standards. Milking equipment and utensils which are intended to come into contact with milk (e.g containers, tanks, etc.) should be easy to clean and disinfect, corrosion resistant and not capable of transferring substances to milk in such quantities as to present a health risk to the consumer.

b. The design of milking equipment, where used, and cans, should ensure there are no crevices or recesses that can interfere with proper cleaning.

c. Milking equipment should be installed and tested (if applicable) in accordance with manufacturer's instructions and in accordance with any available technical standards that have been established by appropriate technical standards setting organizations for such equipment (e.g. IDF, ISO, 3A) in order to assist in assuring that the equipment is functioning properly.

d. Milking equipment should be operated in a manner that will avoid damage to udder and teats and that will avoid the transfer of disease between animals through the milking equipment.

e. Recognized guidelines for the cleaning and maintenance of milking equipment should be followed to ensure obtaining milk that is safe and suitable.

f. Water and media used for rinsing and cleaning should be appropriate for the purpose, such that it will not result in contamination of the milk. Only potable water can be used in contact with milking equipment and other milk contact surfaces.

g. Milking equipment, utensils, and storage tanks and other vessels should be thoroughly cleaned and disinfected following each milking, and dried when

appropriate. Rinsing of equipment and storage tanks following cleaning and disinfection should remove all detergents and disinfectants, except in those circumstances where manufacturer instructions indicate that rinsing is not required.

h. There should be a periodic maintenance and calibration process to ensure that milking equipment is in good working condition.

6 Suitability of the milk

a. Milk should not contain any contaminant at a level that jeopardizes the appropriate level of public health protection when presented to the consumer.

b. Milk that does not appear normal should not be used for human consumption.

c. The microbial load and somatic cell counts of milk should be within the limits set in recognized standards, using good milk production practices, taking into account the technological requirements for subsequent processing.

d. Milk may not be suitable if the milk is:

(1) Is damaged, deteriorated or perished to an extent that makes it unfit for its reasonable intended use; or

(2) Contains any damaged, deteriorated or spoiled substance that makes the milk unfit for its reasonable intended use; or

(3) Contains a biological or chemical agent, or other matter or substance, that is foreign to the nature of the food and that makes the milk unfit for its reasonable intended use.

7 Milk Storage

a. Immediately after milking, the milk should be filtered then stored in properly designed and maintained tanks or cans in a clean place.

b. It should be stored in a manner that avoids the introduction of contaminants into milk and in a manner that minimizes the growth of micro-organisms. Contact of milk with unsanitary equipment and foreign materials should be avoided.

c. In situations where the milk cannot be chilled on the farm, collection and delivery of this milk to a collection center or processing facility within certain time limits may be required. These conditions may be specified in legislation, in Codes of Practice, or by

the manufacturer receiving the milk in collaboration with the milk producer and the competent authority.

7.1 Time and temperature considerations

a. Temperature of the milk should be maintained at levels that will sustain the suitability of milk. The time and temperature conditions for milk storage at the farm should be established taking into account the following factors: (1) effectiveness of the control system in place during and after processing, (2) the hygienic condition of the milk, and (3) the intended duration of storage.

b. Upon collection, milk should be chilled to a temperature not more than 4°C at the fastest time possible [1] unless intended for immediate processing

c. For storage of milk harvested at different times, i.e. morning and afternoon, the most immediately harvested milk should be cooled first prior to its storage with the previously harvested milk.

7.2 Milk storage equipment

a. Milk storage tanks and cans should be designed, constructed, maintained and used in a manner that will avoid the introduction of contaminants into milk and minimize the growth of micro-organisms in milk.

b. Surfaces of milk storage tanks, cans and associated equipment intended to come into contact with milk should be easy to clean and disinfect, corrosion resistant and not capable of transferring substances to milk in quantities that will present a health risk to the consumer.

c. Milk storage equipment should be installed and tested (if applicable) in accordance with manufacturer's instructions and in accordance with any available technical standards that have been established by appropriate technical standards setting organizations for such equipment (e.g. IDF, ISO, 3A) in order to assist in assuring that the equipment is functioning properly.

d. Storage tanks and cans should be cleaned and disinfected regularly and with sufficient frequency to minimize or prevent contamination of milk.

e. Milk tanks and cans should not be used to store any substance other than milk.

[1] Deviations from this temperature may be acceptable if these deviations will not result in an increased risk of microbiological hazards, have been approved by the manufacturer receiving the milk, have been approved by the competent authority and the end product will still meet the microbiological criteria established by the competent authority.

f. Storage tanks or portions of storage tanks should be adequately protected or designed such that they prevent access of insects, rodents and dust in order to prevent contamination of milk.

g. There should be periodic maintenance and calibration to ensure that milk storage equipment is in good working condition.

7.3 Premises for the storage of milk and milking-related equipment

a. Premises for the storage of milk and milking-related equipment should be situated, designed, constructed, maintained and used in a manner that avoids the introduction of contaminants into milk.

b. Premises for the storage of milk should have:

- Suitable refrigeration equipment, when appropriate;
- Suitable supply of potable water for use in milking and in cleaning of equipment and instruments;
- Protection against pests; and
- Easily cleanable floors, if applicable.

8 Collection, transport and delivery of milk

a. In areas without chilling facilities, milk should be delivered immediately to the nearest chilling center. Transport and delivery of milk should be done without undue delay and in a manner that avoids introduction of contaminants into milk and minimizes the growth of microorganisms in milk.

b. Personnel and vehicular access to the place of collection should be adequate for the suitable hygienic handling of milk. In particular, access to the place of collection should be clear of manure, silage, etc.

8.1 Transport and delivery procedures

a. Prior to transport, the milk hauler or collector or chilling center operator should check the individual producer's milk to ensure that the milk does not present obvious indications of spoilage and deterioration. If the milk shows indications of spoilage and deterioration, it should not be collected.

b. Collection and chilling centers, if employed, should be designed and operated in such a manner that minimizes or prevents the contamination of milk.

c. The milk hauler or collection center should, where appropriate, take samples in such a way to avoid contamination of the milk and should ensure that the milk has the adequate storage/in-take temperature prior to collection.

d. Milk to be used for the manufacture of raw milk products shall be collected separately. Mixing, or cross-contamination with milk which does not comply with the quality (including microbiological) expected for the processing of raw milk products shall not be allowed. For example:

- Organize collection pick-ups in such a way that milk for the manufacture of raw milk products be collected separately;
- Use milk transport tankers with compartments that will allow the separation of the milk for different purposes.

8.2 Collection and transport equipment

a. Milk transport tankers and cans should be designed, constructed, maintained and used in a manner that will avoid the introduction of contaminants into milk and minimize the growth of micro-organisms in milk.

b. Guidance for the bulk transport of foods is given in the Code of Hygienic Practice for the Transport of Food in Bulk and Semi-Packaged Food (CAC/RCP 47-2001).

c. Milk cans and transport tankers (including the milk discharge area, valves, etc.) should be cleaned and disinfected with sufficient frequency in order to minimize or prevent contamination of milk. The design and construction should be such that surfaces are easy to clean and disinfect, are corrosion resistant, and not capable of transferring substances to the milk that would make it unfit; and that complete drainage after cleaning and disinfection can be done.

d. Milk transport tankers and cans should only be used to transport milk.

e. Trucks or other vehicles which carry the tank or cans should be cleaned whenever necessary.

8.3 Transport time and temperature

a. Transport temperature and time should be such that milk is transported to the dairy plant or to the collection/chilling center in manner that minimizes any detrimental effect on the safety and suitability of milk.

b. The time and temperature conditions for the hauling of milk from the farm should be established taking into account the effectiveness of control system in place, the hygienic condition of the milk, and the intended duration of storage.

c. The transport temperature of the milk should be maintained at 4°C.[2]

9 Documentation and record keeping

With respect to food safety and where necessary, records of the following should be kept:

- Animal treatment and vaccination records, e.g. products used, date of administration and withdrawal period, disease occurrence affecting safety of milk
- Results of analysis carried out on samples taken from animals (e.g. milk, blood) or other samples taken for diagnostic purposes that have importance for human health
- Identification and movement of animals;
- Regular control of udder health;
- Nature and source of feed;
- Use of pest control chemicals;
- Use of cleaning reagent and chemicals and the concentration used;
- Use of agricultural chemicals;
- Milk storage equipment cleaning and maintenance;
- Milk quality and evaluation; and
- Milk transport condition – temperature, transport time.

[2] Deviations from this temperature may be acceptable if these deviations will not result in an increased risk of microbiological hazards, have been approved by the manufacturer receiving the milk, have been approved by the competent authority and the end product will still meet the microbiological criteria established by the competent authority.

607
608 **REFERENCES**

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