



# *Technews*

**National Dairy Development Board  
For Efficient Dairy Plant Operation**

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## **CODE OF HYGIENIC PRACTICE FOR MILK AND MILK PRODUCTS – 1**

This bulletin includes technical information based on latest developments on products, systems, techniques etc. reported in journals, companies' leaflets and books and based on studies and experience. The technical information in different issues is on different areas of plant operation. It is hoped that the information contained herein will be useful to readers.

The theme of information in this issue is **Code of Hygienic Practice for Milk and Milk Products – 1**. It may be understood that the information given here is by no means complete.

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## 1. INTRODUCTION

It is now generally accepted that to produce safe food, end product testing is not adequate: in addition to subjecting food to required treatment to make it safe for human consumption, it is necessary to implement various measures along with food chain to minimize or to avoid, where possible, occurrence of / contamination by hazards in foods.

Codex guidelines '*Recommended International Code of Practice: General Principles of Food Hygiene (RCP-1-1969, Rev.4 2003, Amend.2-2003)* (General Hygiene Code)' help food producers in producing safe food. These guidelines were suitably presented in *Technews* issues 35 (November–December 2001), 36 (January-February 2002) and 37 (March-April 2002). Subsequently, Codex developed '*Code of Hygienic Practice for Milk and Milk Products (RCP-57- 2004)* (Milk Hygiene Code)'. The objective of this Code is to apply the recommendations of the General Hygiene Code to the particular case of milk and milk products throughout the 'milk chain'.

The Milk Hygiene Code is flexible enough to be applicable to "Small Holder Dairy Farm" which refers to farms where the number of animals per farmer or per herd usually does not exceed 10, milking machines are not generally used, milk is not chilled at the producer level and/or the milk is transported in cans. Such flexibility is indicated by the use of a parenthetical statement "if used" or "if applicable" placed next to the particular provision where the flexibility is needed. Milk Hygiene Code is a supplement to the General Hygiene Code and should be applied in conjunction with it.

The important provisions of the Milk Hygiene Code are presented in this and the next issues of the *Technews* for the reference of dairy management and personnel. Since the government is gradually harmonizing relevant national standards with Codex standards and codes, it becomes all the more important for the dairy industry to be knowledgeable about the important Codex standards and codes. In presenting this code, necessary editing has been carried out, however, without altering the substance. The provisions relevant to milk used for raw milk products are not included here as such products are not made in our country.

## **2. OVERARCHING PRINCIPLES**

The following overarching principles apply to the production, processing and handling of all milk and milk products:

- From raw material production to the point of consumption, dairy products should be subject to a combination of control measures, and these control measures should be shown to achieve the appropriate level of public health protection.
- Good hygienic practices should be applied throughout the food chain so that milk and milk products are safe and suitable for their intended use.
- Wherever appropriate, hygienic practices for milk and milk products should be implemented within the context of HACCP as described in the Annex to the General Hygiene Code. In the case where HACCP cannot be implemented at the farm level, good hygienic practices, good agricultural practices and good veterinary practices should be followed.
- Control measures should be validated as effective. The overall effectiveness of the system of control measures should be subject to validation.

### 3. RELATIVE ROLES OF DIFFERENT STAKEHOLDERS

Although the responsibility lies with the manufacturer for ensuring that the foods manufactured are safe and suitable, there is a continuum of effective effort or controls needed by other parties to assure the safety and suitability of milk products. Important responsibilities of those involved in dairy business are:

- Producers should ensure that good agricultural, hygienic and animal husbandry practices are employed at the farm level. These practices should be adapted, as appropriate, to any specific safety-related needs specified and communicated by the manufacturer.
- Manufacturers should:
  - utilize good manufacturing and good hygienic practices, especially those presented in this code;
  - effectively communicate any needs for additional measures with regard to controlling hazards during primary production to the suppliers/milk producer so that they can adapt their operations to meet them. Such additional needs should be supported by an adequate hazard analysis and should, where appropriate, take into consideration technological limitations during processing, and/or market demands; and
  - implement controls or adapt their manufacturing processes based on the ability of the milk producer to minimize or prevent hazards associated with the milk.

- Distributors, transporters and retailers should ensure that milk and milk products under their control are handled and stored properly and according to the manufacturer's instructions.
- Consumers should accept the responsibility of ensuring that milk and milk products in their possession are handled and stored properly and according to the manufacturer's instructions.
- Competent authorities should have in place legislative framework (e.g., acts, regulations, guidelines and requirements), an adequate infrastructure and properly trained inspectors and personnel.

#### **4. PRIMARY PRODUCTION**

Milk should not contain any contaminant at a level that jeopardizes the appropriate level of public health protection, when presented to the consumer. Contamination of milk from animal and environmental sources during primary production should be minimized. The microbial load of milk should be as low as achievable, using good milk production practices, taking into account the technological requirements for subsequent processing.

##### **1. ENVIRONMENTAL HYGIENE**

- 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. It should be ensured that:
  - water used for the cleaning of the udder and for cleaning equipment used for the milking and storage of milk should be of such quality that it does not adversely affect the safety and suitability of the milk; and

- 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.

## **2. HYGIENIC PRODUCTION OF MILK**

### ***A. Areas and Premises for Milk Production***

- The animal holding area should be:
  - designed, laid-out and provided such that it does not adversely affect the health of animals;
  - designed such that animals with contagious diseases can be separated to prevent the transmission of disease to healthy animals; and
  - restricted in access, including access to the stable and attached premises, if used, to preclude the presence of other species that would adversely affect the safety of the milk.
- The milking areas and related facilities should be:
  - situated, constructed (if applicable) and maintained in a manner that will minimize or prevent contamination of the milk;
  - kept free of undesirable animals such as pigs, poultry and other animals whose presence may result in the contamination of milk.; and
  - easy to clean, especially in areas subject to soiling or infection, e.g., they should have:
    - › flooring constructed to facilitate draining of liquids and adequate means of disposing of waste;
    - › adequate ventilation and lighting;
    - › an appropriate and adequate supply of water of a suitable quality for use when milking and in cleaning the udder of

- the animals and equipment used for milking;
- effective separation from all sources of contamination such as lavatories (if used) and manure heaps; and
- effective protection against vermin.

### ***B. Animal Health***

- The milk should originate from herds or animal that are officially free of brucellosis and tuberculosis, as defined by the OIE International Animal Health Code. Otherwise, the following conditions apply:
  - If not officially free, then milk should originate from herds or animals that are under official control and eradication programmes for brucellosis and tuberculosis; and
  - If controls for brucellosis and tuberculosis were not sufficiently implemented, it would be necessary for the milk to be subjected to subsequent microbiological control measures (e.g., heat treatment) that will assure the safety and suitability of the finished product.
- Adequate management measures should be implemented to prevent animal diseases and to control drug treatment of diseased animals or herds in an appropriate way. Disease preventive measures should be taken, including:
  - eradication of animal diseases, or, control of risk of transmission of the diseases among animals and from animal to human beings;
  - management of other animals in the herd and other farmed animals present (including the segregation of diseased animals from healthy animals); and
  - management of new animals in the herd.

- Milk should be drawn from animals that:
  - are identifiable to facilitate effective herd management practices;
  - do not show visible impairment of the general state of health; and
  - do not show any evidence of infectious diseases transferable to humans through milk including but not limited to diseases governed by the OIE International Animal Health Code.
- Measures to prevent udder infections especially include:
  - the correct use of milking equipment (e.g. daily cleaning, disinfection and disassembling of equipment), if used;
  - the hygiene of milking (e.g. udder cleaning or disinfection procedures);
  - the management of the animal holding areas (e.g. cleaning procedures, design and size of areas); and
  - the management of dry and lactation periods (e.g. treatment for the drying off).

### ***C. General Hygienic Practice***

- In relation to animal feeding practices, the relevant aspects of the Codex Code of Practice on Good Animal Feeding (CAC/RCP-54-2004) apply.
- In relation to pest control, the guidance provided below are considered good practices:
  - Making efforts to minimize the presence of insects, rats and mice. Good preventive measures such as proper building construction and maintenance (if applicable), cleaning, and removal of faecal waste can minimize pests. Use of pesticides or rodenticides for pest control should be the last resort.



- Avoiding accumulations of manure to develop close to milking areas.
- Protecting feed from pest infestation. Animal feed stores should be located at a suitable place and feed kept in containers that provide adequate protection against pests.
- Using only officially approved pest control products for use in food premises and using them in accordance with the manufacturer's instructions, if it is necessary to resort to chemical pest control measures.
- Storing pest control chemicals in a manner that will not contaminate the milking environment. Such chemicals should not be stored in wet areas or close to feed stores. It is preferable to use solid baits, wherever possible.
- Not using pesticides during milking.
- The level of veterinary drug residues in milk can be controlled by:
  - application of good husbandry procedures to reduce the likelihood of animal disease and thus the use of veterinary drugs;
  - use of only those medicinal products and medicinal premixes that have been authorized by competent authority;
  - adhering to withdrawal periods. Milk from animals that have been treated with veterinary drugs that can be transferred to milk should be discarded until the withdrawal period specified for the particular veterinary drug has been achieved. Established maximum residue limits (MRLs) for residues of veterinary drugs in milk may serve as a reference for such verification. Appropriate sampling schemes and testing protocols should be used to verify the effectiveness of on-farm controls of veterinary drug use and in meeting established MRLs; and

- keeping a record of the products used, including the quantity, the date of administration and the identity of animals. The veterinarian and/or the livestock owner or the collection centre should maintain the records.

#### ***D. Hygienic Milking***

- Effective hygienic practices should be applied in respect of the skin of the animal, the milking equipment (whenever used), the handler and the general environment e.g. faecal sources of contamination.
- Milking personnel should be in good health. In particular:
  - the individuals 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. Medical examination of a milk handler should be carried out if clinically or epidemiologically indicated;
  - they should wash hands and forearms (up to elbow) frequently and always before initiating milking or handling of milk;
  - persons having exposed abrasions or cuts on their hands or forearms should not perform milking. Any injury on hands or forearms must be covered with a water-resistant bandage; and
  - they should wear suitable clothing should during milking and should be themselves clean at the commencement of each milking period.
- In relation to milking animals, following care should be exercised:

- Milking animals should be maintained in an as clean state as possible. Prior to any milking, the udders, teats, groins, flanks and abdomen of the animal should be clean.
- Animals showing clinical symptoms of disease should be segregated and/or milked last, or milked by using separate milking equipment or by hand, and such milk should not be used for human consumption.
- Operations such as feeding the animals or placement / removal of litter should be avoided prior to milking in order to reduce the likelihood of contamination of the milking equipment and the milking environment from manure or dust.
- In relation to milking equipment, utensils and storage tanks, following points are important:
  - These equipment should be designed, manufactured and maintained in such a way that they can be adequately cleaned and do not constitute a significant source of contamination of milk. There should be no crevices or recesses that can interfere with proper cleaning.
  - Where applicable, these 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.
  - These equipment 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 when the

manufacturer instructions indicate that rinsing is not required. Water used for cleaning and rinsing should be appropriate for the purpose.

- Milk tanks and cans should not be used to store any harmful substance that may subsequently contaminate milk.
  - Storage tanks or portions of storage tanks that are outdoors should be adequately protected or designed such that they prevent access of insects, rodents and dust in order to prevent contamination of milk.
  - Milking equipment, if used, should be designed such that it does not damage teats and udders during normal operation.
  - There should be a periodic verification process to ensure that milking equipment is in good working condition.
  - Between inspections, these equipment should be maintained in proper working condition.
- It should be ensured during milking that:
    - the foremilk (initially drawn small quantity of milk) from each teat is discarded or collected separately and not used for human consumption unless it can be shown that it does not affect the safety and suitability of the milk;
    - it is monitored by appropriate means that the milk appears normal, for example by careful observation of the condition of milking animals, by checking the milk of each animal for organoleptic or physicochemical indicators, and by using records and identification of treated animals. If the milk does not appear normal, the milk should not be used for human consumption.
    - appropriate precautions are taken to minimize the risk of infections to teats and udders, including the avoidance of damage to tissue.

### **3. HANDLING, STORAGE AND TRANSPORT OF MILK**

- With consideration given to the end use of the milk, handling, storage and transport of milk should be conducted in a manner that will avoid contamination and minimize any increase in the microbiological load of milk.
- The need for time/temperature control at farm level should be clearly communicated by the manufacturer of the milk products.

**A. *Milking and Storage Equipment*** – Refer hygienic practices described for ‘Milking equipment, utensils and storage tanks’ under ‘D. Hygienic Milking’ in ‘2. Hygienic Production of Milk’, above.

**B. *Premises for, and Storage of, Milk and Milking-Related Equipment***

- Premises for the storage of milk and milking-related equipment should have:
  - suitable milk refrigeration equipment, when appropriate;
  - a sufficient supply of water of a suitable quality of for use in milking and in cleaning of equipment and instruments;
  - protection against vermin;
  - easily cleanable floors, if applicable; and
  - 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.

- The following guidance should be utilized in relation to storage of milk:
  - milk should be stored in properly designed and maintained tanks or cans in a clean place;
  - the storage temperatures and times should be such that minimizes any detrimental effect on the safety and suitability of milk;
  - the time and temperature conditions for milk storage at the farm should be established taking into account the effectiveness of the control system in place during and after processing, the hygienic condition of the milk and the intended duration of storage; and
  - in situations where the milk cannot be chilled on the farm, collection and delivery of this milk to a collection centre or processing facility within certain time limits may be required.

### ***C. Collection, Transport and Delivery Procedures and Equipment***

- Important guidance on appropriate collection, transportation and delivery of milk are provided below:
  - 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.
  - Collection and chilling centres, if employed, should be designed and operated in such a manner that minimizes or prevents the contamination of milk.
  - Prior to collection, the milk hauler or collection/chilling centre 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.

- The milk hauler or collection centre operator 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.
  - The milk hauler should receive adequate training in the hygienic handling of raw milk.
  - Milk haulers should wear clean clothing.
  - Milk hauling 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.
  - Milk haulers should perform their duties in a hygienic manner so that their activities will not result in contamination of milk.
  - The driver should not enter the stables or other places where animals are kept, or places where there is manure.
  - Should driver clothing and footwear be contaminated with manure, the soiled clothes and footwear should be changed or cleaned before work is continued.
  - The tanker driver should not enter the processing areas of the dairy plant. Conditions should be arranged to allow necessary communication with the staff of the dairy, delivery of milk samples, dressing, rest breaks, etc. without direct contact taking place with the dairy processing areas or with staff members involved with processing milk and milk products.
- In relation to milk transport tankers and cans, the following points are important:

- Milk transport tankers and cans should be designed and constructed such that they can be effectively cleaned and disinfected.
  - Milk transport tankers and cans should be designed and constructed to ensure complete drainage.
  - Milk transport tankers and cans should not be used to transport any harmful substance. If milk transport tanks and cans are used to transport foods other than milk, precautions such as the implementation of adequate cleaning protocols should be taken to prevent any subsequent milk contamination.
  - Surfaces of milk transport tankers, 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 the milk in such quantities as to present a health risk to the consumer.
  - 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.
  - After disinfection, tankers and cans should be drained.
  - Lorries, trucks or other vehicles which carry the tank or cans should be cleaned whenever necessary.
- The time and temperature conditions for the collection and transport of milk from the farm should be established, taking into account the effectiveness of the control system in place during and after processing, the hygienic condition of the milk and the intended duration of storage, so as to minimize any detrimental effect on the safety and suitability of milk.



#### 4. DOCUMENTATION AND RECORD KEEPING

- Records should be kept, as necessary, to enhance the ability to verify the effectiveness of the control systems.
- With respect to food safety, records should be kept where necessary on:
  - prevention and control of animal diseases with an impact on public health;
  - identification and movement of animals;
  - regular control of udder health;
  - use of veterinary drugs and pest control chemicals;
  - nature and source of feed;
  - milk storage temperatures;
  - use of agricultural chemicals; and
  - equipment cleaning.

### NEWS SECTION

#### *Indian Food Laws*

- **Notification GSR 70(E) of 5 February 2008 of the Ministry of Health and Family Welfare:** It is a corrigendum to the GSR 491 (E) of 21 August 2006 of the Ministry of Health and family Welfare that amended the PFA Rules by defining several new terms, revising Rules 32 (labeling requirements), 37A (proprietary foods), 37B (infant milk substitute/infant foods) and 42 (form of labels). It was scheduled to become applicable from 20 August 2007 (refer *Technews* issue 64, September-

October 2006). Subsequently, the date of applicability of GSR 491(E) was postponed to 20 February 2008 through the GSR 518(E) of 31 July 2007 (refer *Technews* issue 69, July–August 2007). The GSR 70(E) now extends the date of its applicability further, and accordingly the provisions of GSR 491(E) would now be applicable from 20 May 2008.

### ***Codex Alimentarius Commission (CAC)***

- The 8<sup>th</sup> Session of the Codex Committee on Milk and Milk Products (CCMMP) was held during 4-8 February 2008 in Queenstown, New Zealand (refer *Technews* 71, November–December 2007). Some of the important agenda items discussed and the decisions of the Committee on these are provided below:
  - a) Codex model export certificate for milk and milk products: The Committee advanced this draft standard for final adoption by the Commission at Step 8.
  - b) Amendments to the Codex standard for fermented milks to include provisions for fermented milk drinks: The Committee advanced this draft standard for adoption by the Commission at Step 5.
  - c) Revised standard for processed cheese: The Committee returned this draft standard to Step 2/3 for revision by a Physical Working Group and reconsideration at its next session in 2009.
- The period April-May 2008 also features meetings of the following Codex Committees:

- Codex Committee on Pesticide Residues, 14-19 April 2008, Hang Zhou, China.
- Codex Committee on Food Additives, 21-25 April 2008, Beijing, China.
- Codex Committee on Food Labelling, 28 April–2 May 2008, Ottawa, Canada.

### ***International Dairy Federation (IDF)***

#### **IDF has published the following Bulletins/Standards recently:**

- IDF Bulletin No.424/2008: Advances in Analytical Technologies.
- IDF Bulletin No.425/2008: How to use Sampling Plans for Inspection by Variables in the case of Measurement Error.
- IDF Bulletin No.426/2008: Milking Management of Dairy Buffaloes.
- IDF 89 – ISO 5544: Caseins – Determination of ‘fixed ash’ (Reference method).
- IDF 90 – ISO 5545: Rennet caseins and caseinates – Determination of ash (Reference method).
- IDF 91 – ISO 5547: Caseins – Determination of free acidity (Reference method).
- IDF 140-1 – ISO 9233-1: Cheese, cheese rind and processed cheese - Determination of natamycin content - Part 1: Molecular absorption spectrometric method for cheese rind.
- IDF 140-2 – ISO 9233-2: Cheese, cheese rind and processed cheese – Determination of natamycin content - Part 2: High-performance liquid chromatographic method for cheese, cheese rind and processed cheese.
- IDF 148-1 – ISO 13366-1: Milk – Enumeration of somatic cells – Part 1: Microscopic method (Reference method).

- IDF 148-2 – ISO 13366-2: Milk – Enumeration of somatic cells – Part 2: Guidance on the operation of fluoro-opto-electronic counters (Reference method).
- IDF 172 – ISO 14156: Amendment 1: Milk and milk products – Extraction methods for lipids and liposoluble compounds.
- IDF 221 – ISO 3432: Cheese – Determination of fat content – *Butyrometer* for *Van Gulik* method.
- IDF 222 – ISO 3433: Cheese – Determination of fat content – *Van Gulik* method.

#### **IDF / ISO Standards withdrawn**

- IDF Standard 032, Published in 1965 (withdrawn): Detection of Vegetable Fat in Milkfat by the Phytosteryl Acetate Test.
- IDF Standard 060 – ISO 5944, published in 2001 (withdrawn): Milk and milk-based products: Detection of coagulase-positive staphylococci – Most probable number technique.

For purchasing the IDF publications, the following may be contacted:

Mr. Oscar Chavez  
Office Manager  
International Dairy Federation  
Brussels  
Belgium  
Email: [OChavez@fil-idf.org](mailto:OChavez@fil-idf.org)



## **CODE OF HYGIENIC PRACTICE FOR MILK AND MILK PRODUCTS - 1**

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**Please send your letters to:**

Dr. N.N. Varshney  
National Dairy Development Board  
Post Box No.40  
Anand 388001  
Gujarat

Fax No. (02692) 260157  
Email : nnv@nddb.coop