



CODE OF PRACTICE FOR MILK PRODUCERS



PREFACE

It is a well-known fact that compliance of dairy products with food safety standards is of crucial importance to the dairy industry and consumers, as substandard products can cause significant harm to these role-players. It is also very important for the consumer and the viability of the dairy industry, that the integrity of dairy products are protected.

To achieve this, a farm to fork approach needs to be applied which gives consideration to all legal and voluntary standards relating to product composition and food safety, animal health, animal feed, milking parlours, the transportation of milk, processing plants and storage.

The Dairy Standard Agency (DSA) is a non-profit company established by the organised dairy industry to promote the improvement of compliance of milk and other dairy products with food safety, product composition and metrology standards.

The DSA today functions as one of the most significant self-regulatory initiatives in the South African agro-processing sector. The role of integrated chain management for food safety is a high priority of the DSA.

The DSA Code of Practice for Milk Producers, which is the second since the 2006 version (DSA Code of Practice) is aimed at supporting the primary South African dairy sector with compliance to all relevant food safety regulatory standards and voluntary standards.

Self-regulation in terms of food safety requires the auditing of production, processing and distribution facilities throughout the value chain. It is also the aim of this Code of Practice to provide stakeholders in the industry with a norm by which supplier quality assurance can be measured.

The Code of Practice offers a systematic approach towards compliance with food safety requirements at primary production level, and also addresses the minimum requirements for export certification at farm level.

It is our wish that this guideline document will serve the industry and consumers well. Our sincerest thanks to Milk South Africa for making statutory funds available, the DSA board of directors and members of the DSA Dairy Quality Club for non-statutory funding, and all other sponsors involved. Special thanks to the DSA personnel involved in this project, Diversey for their sponsorship and Plaas Publishing for their commitment towards this guideline document.

The DSA's existence is the direct result of the acceptance of a strategic approach by the organised dairy industry, consisting of Milk SA, the South African Milk Processors' Organisation (SAMPRO) and the Milk Producers' Organisation (MPO). This approach is aimed at increasing the market for milk and other dairy products, the improvement of international competitiveness of the South African dairy industry and the empowerment of previously disadvantaged people.





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INTRODUCTION



Primary milk producers (or dairy farmers) need to ensure that the safety and quality of their raw milk will comply with legislation and will satisfy the highest expectations of dairy product manufacturers and, ultimately, the consumer.

The safety and quality of milk on primary level is of utmost importance. Various actions can be undertaken to improve the safety and quality in the dairy supply chains. The focus should be on preventing or reducing the likelihood of introducing a hazard which may adversely affect the safety of milk or its suitability for consumption at later stages in the food chain, rather than solving it after it has occurred.

Raw milk may contain micro-organisms that are pathogenic to humans and their source may lie within or outside the udder. The milking procedure, handling, storage equipment and transportation of raw milk carry a further risk of contamination by humans and the environment as well as growth of the inherent pathogens. Quality defects of milk products may, for example, be the result of heat-stable enzymes produced by micro-organisms present in the raw milk. Chemical contaminants may originate from cleaning chemicals, veterinary medicine, pesticides and feed.

Integrated chain management for food safety is an important tool in ensuring the hygienic safety of milk and milk products. It is important to

note that food safety is a shared effort among all role-players in the food chain, including, but not limited to, competent authorities, feed manufacturers, milk producers, veterinary practitioners, feed and raw material suppliers, processors and distributors.

Control measures implemented along the food chain should be interconnected to ensure effective food safety and risk management. These control measures should be integrated in such a way that the outcome at one point in the food chain, can be related to the outcome at another.

No individual step in the food chain should be managed without consideration of what takes place in the chain of events prior to the particular measure being applied or what will take place subsequent to a particular step. The implementation of systematic approaches and systems that are targeted to ensure the maintenance of the integrity of suppliers' milk, is necessary in today's terms as a measure to prove due diligence.

Adulteration of farmers' milk is a major threat to food safety and compositional integrity, and the application of a practical proactive approach is required. As part of a risk-based approach, the following leading principles are fundamental in efficiently maintaining the integrity of suppliers' milk and managing the supply chain:

- Establishment of effective communication with other key players operating in the same chain.
- Demonstration of food safety skills and in-depth understanding of the hazards that need to be controlled at the step(s) for which the farmers are responsible.
- The use of reliable suppliers of high quality and safe products (ingredients or raw materials) and services.
- Understanding the importance of sharing responsibility by meeting the requirements with regard to the food safety of

products supplied to the subsequent step in the food chain.

- Cooperation between individuals and organisations through the use of industry-specific codes of conduct and food safety management systems to address hazard control at points in the food chain where cost-effectiveness is optimised, should be encouraged.

FOOD SAFETY HAZARDS

Milk and other dairy products are expected to meet minimum safety requirements as required by customers, consumers and regulatory authorities. It is therefore essential that levels of undesirable substances should be sufficiently low and that their concentration in the food meant for human consumption, is consistently below the level of concern. Undesirable substances are normally referred to as food safety hazards, which may harm the consumer immediately at consumption, as an injury, or over a longer period of time leading to long-term illness or even death.

These undesirable substances may be:

- Biological (pathogens, insects, pests, etc.).
- Chemical (allergens, lubricants, cleaning chemicals, pesticide residues, antibiotics, melamine, heavy metals, etc.).
- Physical (glass, wood splinters, metal pieces, stones etc.).

The undesirable substances or hazards may be introduced into raw milk during inappropriate and uncontrolled food-handling practices.

CONTROL MEASURES

A control measure includes any action or activity used to eliminate a hazard or reduce it to an acceptable level. In addition, the term also refers to any action or activity taken to reduce the likelihood of the occurrence of a hazard in milk or milk products. Thus, control measures include both process controls, e.g.

cooling, as well as other activities such as general hygiene and pest-control programmes.

OBJECTIVES

Primary milk production should be managed in such a way as to ensure that milk and milk products are safe and suitable for consumption. The following objectives should be met:

- Avoid areas where the environment poses a threat to the safety of milk.
- Control pests, animal diseases and plants.
- Control contaminants from the environment, facility, equipment, personnel, animals, feed and water.
- Control and manage the diseases of animals and plants in such a way that it doesn't pose a threat to milk safety.
- Adopt practices that ensure safe milk production.

RATIONALE

Milking usually takes place at least twice a day. Milk is recognised as a highly perishable foodstuff that is easily susceptible to microbial contamination. Contamination of raw milk can vary widely due to milk-handling practices, environmental factors, cleaning and disinfection procedures and general hygiene practices. The quality of pasteurised milk and milk products is influenced significantly by the production, collection and handling methods on the farm. It is of the utmost importance to reduce the risks which may adversely affect the safety of milk.

ENVIRONMENTAL HYGIENE

Potential sources of contamination from the environment should as far as possible be identified. Primary milk production should not be conducted in areas where the presence of potentially harmful substances would lead to unacceptable levels of such substances in milk, e.g. dust. Producers should, as far as it is practical, implement measures to control contamination from air, soil, water, feedstuffs, fertilisers (including natural fertilisers), pesticides, veterinary drugs or any other agent used in primary production.

HYGIENIC PRODUCTION OF MILK

Primary production activities should aim to ensure the production of safe and high quality raw milk at all times. This includes identifying any specific points where a high probability of contamination may exist. The following measures are needed to minimise the probability of contamination:

- Avoid or eliminate unhygienic practices, e.g. dirty equipment.
- Ensure effective cleaning and disinfection procedures.
- Take specific measures to minimise the probability of contamination.
- Control plant and animal health so that it does not pose a threat to human health through food consumption, or adversely affect the suitability of the product.
- Protect milk from faecal and other contamination, e.g. good milking practices, waste management and appropriate storage of harmful substances.

CLEANING, MAINTENANCE AND PERSONNEL HYGIENE

Appropriate facilities and procedures should be in place to ensure that:

- All cleaning, disinfection and maintenance is carried out effectively.
- An appropriate level of personal hygiene is maintained.

FOOD SAFETY MANAGEMENT SYSTEM (FSMS)

Food safety may be achieved by implementing food safety and quality programmes based on hazard analysis and critical control points (HACCP) principles, especially pre-requisite programmes.

The general requirement for an FSMS is a well-documented, fully implemented and well-maintained system. The FSMS should also be supported with records (documented) on corrective actions or non-conformities that are identified. The documentation system may be in an electronic or printed ver-

sion, and needs to be readily available and legible.

Management commitment is of the utmost importance and evidence of communication of the FSMS to all personnel, needs to be available. The requirements for the FSMS are based on regulatory and compulsory specifications, as well as industry standards and customer requirements. (Refer to reference regulations, standards and guidelines.)

The basis of the FSMS at farm level is pre-requisite programmes (PRPs), including good agricultural practices (GAPs), good farming practices (GFPs), good hygiene practices (GHPs), good milking practices (GMPs), good veterinary practices (GVPs) and good laboratory practices (GLPs).

This Code of Practice will provide information on the PRP programmes, including documentation and records needed for a sustainable FSMS.

REGULATIONS AND STANDARDS

Requirements for the hygienic and safe production of milk are obtained from legislation, South African National Standards (SANS), Codex Alimentarius, the Food and Agricultural Organisation (FAO) and the International Dairy Federation (IDF).

The dairy industry in South Africa is regulated by various acts, regulations and guidelines. The departments responsible for the execution of food safety and related matters, are the Department of Health (DOH), the Department of Agriculture, Forestry and Fisheries (DAFF) and the Department of Trade and Industry (DTI).

DOH

Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972)

- Regulations relating to hygiene requirements for milking sheds, the transport of milk and relating matters (R961/2012).

DAFF

Agricultural Products Standards Act, 1990 (Act 119 of 1990)

- Regulations relating to dairy and imitation dairy products, as amended (R2581/1987).

Animal Disease Act, 1984 (Act 35 of 1984)

Fertiliser, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947)

DTI

Consumer Protection Act, 2008 (Act 68 of 2008)

Information in this Code of Practice was based on legislation, voluntary standards and guidelines and must be interpreted according to the contents of all referenced material.



References to **legislation** will be indicated in **RED**, references to **SANS documents** will be indicated in **BLUE**, references to **ISO/TS 22002-3** will be in **PURPLE**. **Dairy Standard Agency** requirements, recommendations and guidelines are in **BLACK**.

South Africa is not a third-world country with elements of the first world, nor a first-world country with elements of the third world. It is both at the same time, sometimes in the same place. The implementation of an on-farm safety and quality programme therefore needs to be applicable across all sectors in the South African dairy industry, which are in the established, emerging and subsistence sectors.



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DEFINITIONS

cleaning

action(s) dealing with the removal of soil, food residue, dirt, grease or other objectionable matter.

cleaning in place / CIP

cleaning of equipment by circulation of cleaning and rinse solutions without the dismantling of equipment.

clean water

water that does not compromise food safety in circumstances of its use or purified water that does not contain micro-organisms, harmful substances in quantities capable of directly or indirectly affecting the safety of food.

competent person

person, qualified by knowledge and practical experience, with the necessary skills and ability to perform an assigned task.

contamination

introduction or occurrence of a contaminant in food, feed or in food and feed environment.

contaminant

any biological or chemical agent, foreign matter or other substances not intentionally added to food or feed which may compromise food safety.

cross-contamination

contamination produced when a food process, a food product or a raw material contaminates other processes, food products or raw materials indirectly from one source to another, either with food safety hazards or odour and flavour.

disinfection

application of disinfectants or physical agents and processes that are suitable for use in

the food industry in order to kill most vegetative forms of pathogenic and other micro-organisms (but not necessarily all bacterial and fungal spores, mycobacterium, rickettsia or viruses).

disposal system

a subterranean or ground level tank or other vessel, sewerage system, dam or farmland into or onto which effluent may be discharged.

effluent

means any liquid, liquid or solid waste or liquid or solid manure emanating from a milking shed.

food safety management system

A food safety management system (FSMS) is interrelated elements that combine to ensure that food does not cause adverse human health effects. These elements include programmes, policies, procedures, work instructions, practices, processes, goals, objectives, methods, controls, responsibilities, relationships, documents, records, and resources. A FSMS is often one part of a larger management system.

feed

any single or multiple materials, whether processed, semi-processed or raw, which is intended to be fed directly to food-producing animals.

feed additive

any intentionally added ingredient not normally consumed as feed by itself, whether or not it has nutritional value, which affects the characteristics of feed or animal products.

feed ingredient

component part or constituent of any combination or mixture making up a feed, whether

or not it has a nutritional value in the animal's diet, including feed additives.

food handling organisation

business which, during its operations, produces, processes, prepares, manufactures, stores, transports, distributes or sells foodstuffs or is engaged in any activity which might impact on the safety of such foodstuffs.

food safety hazard

a food safety hazard is an agent or condition that could potentially cause an adverse human health effect. Hazards may be either biological, chemical, or physical. The condition of the food itself can also be hazardous.

Food safety hazards can also be found in or on animal feed and feed ingredients. Since these may be transferred to food through the consumption of animal products, they can also cause adverse human health effects.

medicated feed

any feed which contains veterinary drugs.

pest

unwanted species of plant or animal that may have a detrimental effect for humans, their activities or the products they use or produce, or for animals or for the environment. The term refers to small animals, birds, and insects that destroy crops, spoil food or spread disease in fields or on farm premises.

potable water

water of sufficiently high quality that can be consumed or used with low risk of immediate or long-term harm. (Refer to SANS 241.)

prerequisite programme / PRP

basic conditions and activities that are nec-

essary to maintain a hygienic environment throughout the food chain suitable for the production, handling and provision of safe end food products and safe food for human consumption. organisation operates and the type of organisation. Examples of equivalent terms are: Good Agricultural Practice (GAP), Good Hygiene Practice (GHP), Good Laboratory Practice (GLP), Good Manufacturing Practice (GMP), Good Distribution Practice (GDP), Good Veterinarian Practice (GVP), Good Production Practice (GPP), and Good Trading Practice (GTP).

record

document that provides objective evidence of actions undertaken or results achieved.

veterinary drug

any substance applied or administered to any food-producing animal, such as meat or milk-producing animals, poultry, fish or bees, whether used for therapeutic, prophylactic or diagnostic purposes or for modification of physiological functions or behaviour.

withholding / withdrawal period

time during which a crop, an animal or its products cannot be used for human consumption following the last application of a plant protection product to the crop (including pastures), or the last application or administration of a veterinary drug to the animal, that ensures that the foodstuff does not contain any residues in quantities in excess of established maximum residue limits.

waste

unwanted or undesired material, including hazardous substances and food product that is not fit for human consumption or that does not comply with food safety requirements.



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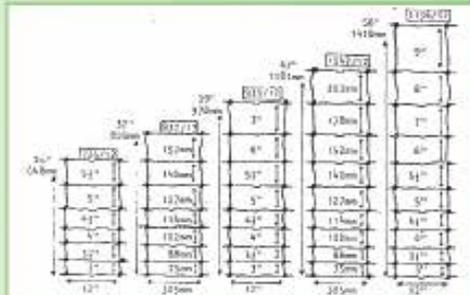
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1. GENERAL REQUIREMENTS FOR THE MILKING SHED

Milking sheds range from structures where a few cows are milked in the open, to modern herringbone and rotary sheds milking many hundreds of cows more than once a day. A milking shed, however, has to be approved by the relevant local health authority before milk may be produced for human consumption.

It is important to ensure that a milking shed should only be used for the milking of dairy animals and that special attention should be given to the hygienic and safe handling and storage of the raw milk.

Regulation R961:

“Approved milking shed” means a milking shed in respect of which a certificate of acceptability has been issued and is enforced.

6. (7) A milking shed shall not be used for any other purpose except the production and handling of milk.

1.1 APPROVED MILKING SHED

The minimum requirements that a milking shed must comply with are found in Regulation R961.

Regulation R961:

PROHIBITION ON THE PRODUCTION OF MILK, EXCEPT IN AN APPROVED MILKING SHED

2. (1) No person shall use a milking shed for the purpose of milking dairy stock in order to produce milk for human consumption, unless the milking shed in which the dairy stock are milked is an approved milking shed and such milking shed is used in accordance with the provisions of these regula-

tions and the conditions of the certificate of acceptability issued in respect of that milking shed.

(2) The provisions of sub-regulation 1 shall not be applicable to a milking shed in which milk is produced solely for own use.

(3) If a local authority is of the opinion that a milking shed is being used in a way which constitutes a health hazard or that a situation has developed in the milking shed constituting such hazard, the local authority may order in writing the owner or possessor of an existing milking shed not to remove any milk for human consumption from the milking shed until the hazard or situation has been rectified to the satisfaction of the local authority.

1.2 CERTIFICATE OF ACCEPTABILITY

The first step in establishing a primary milk production facility referred to as a milking shed, is to obtain a certificate of acceptability from the local authority.

Regulation R961:

3 (1) Any person wishing to apply for a certificate of acceptability in respect of a milking shed shall apply for it in writing to the local authority in whose area of jurisdiction the milking shed is situated on a form containing at least the particulars that are substantially the same as these contained in the form in Annexure A to these regulations.

(2) Such an application shall be submitted to the local authority in whose area of jurisdiction the milking shed is located or will be erected, together with:

(a) A site plan with north indicated and with an indication of all adjacent and bordering buildings and their uses.

(b) A layout sketch to a scale of 1:100 of all the milking shed or milk production

facilities referred to in Regulation 6, consisting of a floor or ground plan, a sectional view and a vertical elevation.

(3) Upon receipt of an application referred to in Regulation 3, the local authority shall without delay refer the application to an inspector or any employee of the local authority concerned for consideration.

1.3 DESIGN OF A MILKING SHED

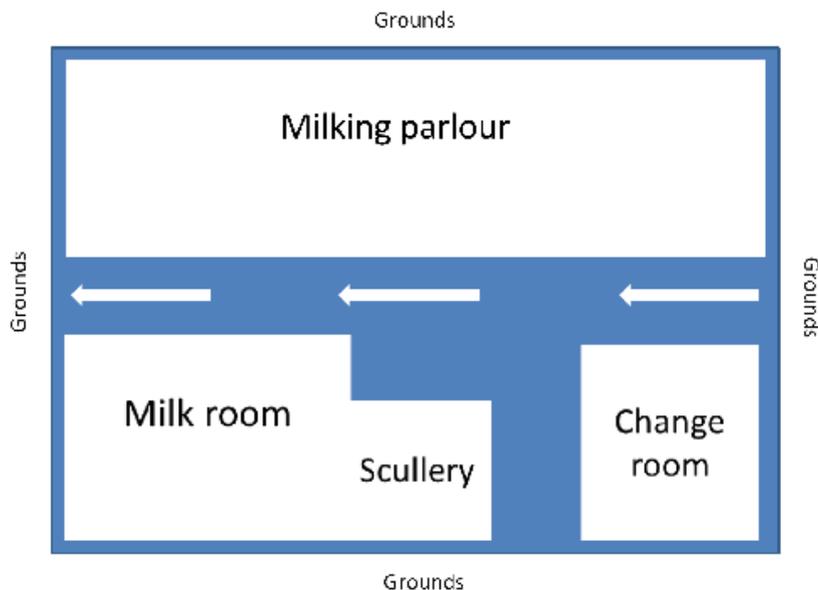
According to regulation R961 an approved milking shed shall consist of the following structures:

- Milking parlour
- Milk room
- Change room
- Scullery (may be part of the milk room)

(ii) A milking room referred to in paragraph 3 where milk shall be received from the milking parlour, and such milk shall be stored and where it may be treated, processed and packed, provided that where due to the design and construction of a milking shed all the requirements included under paragraph 3 cannot be situated within the milking room, it should be otherwise provided on the premises.

(iii) A change room referred to in paragraph 4.

(iv) A scullery for the washing, cleaning, disinfection and sterilisation of milk containers and other unfixed apparatus and equipment used in the handling of milk.



REGULATION R961 STANDARDS AND REQUIREMENTS

Milking sheds

6. (1) (a) An approved milking shed shall consist of at least:
(i) A milking parlour referred to in paragraph 2.

(b) (i) The facilities referred to in paragraph (b) shall, subject to the provisions of subparagraph (ii) be erected as separate rooms in one building complex or as separate detached buildings.

(ii) A scullery referred to in paragraph (iv), may be erected as an integral part of a milk room or as a separate room.

1.4 GROUNDS OF THE MILKING SHED, INCLUDING OUTSIDE STRUCTURES, ROADS AND ANIMALS

Environmental contaminants have a negative influence on the quality and safety of raw milk. The environment of the milking shed shall be assessed to determine if sources of possible contamination may be present.

Recommendation:

Ideally there should be a pathway of width at least one metre around the milking shed. The pathway should be kept clean and clear of materials.

ISO/TS 22002-3

5.2 Location

- The organisation shall implement measures that minimise the likelihood of introducing harmful contaminants from environmentally polluted areas.
- The organisation shall identify potential sources and the nature of such contamination in the neighbouring environment.
- The organisation shall identify water sources and reserves used for farming activities, e.g. springs, rivers and wells.
- The organisation should identify on a map water sources and reserves, and locate sources of potential contamination.
- Local authorities can assist in the identification of water sources and reserves. Monitoring local district development plans is useful to foresee and prevent future problems.

5.3 Construction and layout of the premises

Farm premises shall be designed and constructed in such a way as to maintain an appropriate degree of hygiene and to minimise the likelihood of cross-contamination.

Good hygiene and farming practices are needed to control possible sources of contamination. Access to the milking shed grounds shall be managed by

a perimeter fence to prevent animals and/or unauthorised persons access to the milk shed.

Although it is recognised that dogs and animals are part of the milking shed environment, the access of these animals to the milking parlour needs to be restricted to guard/security dogs only, while all animals must be prevented from entering the milk room. All possible precautions shall be taken to prevent birds from nesting or perching in the milking parlour, with total exclusion from the milk room, while complying with the regulations on the conservation of wildlife.

The grounds and premises shall be kept free of conditions that could lead to the contamination of the milk. The grounds shall be kept free from uncut weeds and grass, litter, waste and miscellaneous materials. Prevention of the



breeding or harbourage of micro-organisms, insects, rodents or birds can be obtained by the orderly storage of equipment and materials, with waste stored in suitable containers that can be thoroughly cleaned. If waste containers are not stored in an enclosed area, they must be fitted with tight-fitting lids.

There should be no stagnant water and special attention must be paid to gutters, open drains, potholes and pools. Inadequate drainage or incorrectly sloped surfaces can cause water to become stagnant.

The design and construction of buildings and facilities and the building materials used, must permit easy and adequate cleaning and disinfecting, which will ensure that a high level of good hygiene is maintained. Roofs, valleys and gutters must be kept clear of debris, including insects and dead birds, and must be inspected at appropriate defined intervals. Outside structures shall be kept clear of debris, bird droppings, etc. as these can contaminate food (milk). Unused buildings, outhouses, service buildings, etc. shall be kept clean and tidy in order to eliminate sites where micro-organisms, insects, rodents and birds can be present and/or multiply.

SANS 10049

7.2.1 Location, size, hygienic design and conditions

7.2.1.3 The premises of the food-handling organisation shall be well-drained and adequately fenced to keep out larger animals, such as cats and dogs, as well as unauthorised persons and vehicles.

7.2.1.4 Outdoor work areas, roads and pathways on the premises shall have a permanent surface of concrete, brick, bitumen or any other durable material.

7.2.1.5 Areas outside the food-handling organisation's premises and not in actual use, shall either be covered by lawn or have a surface that is not

liable to produce dust, and shall not contain toxic substances.

7.2.1.6 The food-handling organisation's premises and equipment shall be designed to permit the processing of raw materials without undue delay. The buildings shall be designed and constructed to prevent the entry and harbouring of insects, birds, rodents and other vermin.

7.2.1.7 Buildings of the food-handling organisation shall be located away from areas subject to flooding, prone to infestations of pests and micro-organisms, and where waste, either solid or liquid, cannot be removed effectively.

7.2.1.8 Sewage and effluent lines shall be constructed in such a manner to avoid the contamination of potable water supplies, of food handling areas and of the food product.

1.5 WASTE MANAGEMENT

Solid waste should be handled in such a manner to prevent contamination of products (milk), animals and/or the environment. Milking animals must be kept away from areas where effluent/manure or waste is stored, to minimise exposure. Milking animals should not be exposed to human waste or any other waste likely to contain pathogens of significance to human health. Special attention and care should be paid to pest control in waste collection areas.

Facilities for the storage of waste should be designed to preclude the entry and harbourage of pests and to avoid the contamination of food, potable water, equipment, buildings and roadways on the premises and the environment in general.

Clearly demarcated and marked waste containers should be used for the disposal of waste. These containers should be such, that it cannot be mistaken for food containers.

Skips or containers that contain waste material should be covered and emptied at least once

a week, or more frequently, to minimise the risk of infestation. Skips or containers for waste should be located as far as practical from the milking parlour and milk room.

Combustible waste, if incinerated, must be burned in an area that is located at an adequate distance from the milking shed, to avoid a fire hazard, contamination of the air supply or environment.

All floor drains shall be fitted with effective traps and shall be covered with a suitable grid for liquid waste. The floor drains shall be kept clean and shall be cleaned or disinfected (or both) at appropriate intervals to prevent the risk of contamination of the milking equipment and milk.



Regulation R961

6. (5) Any effluent originating from a milking shed shall:

- (a) Not be stored, treated or dumped in any place except in or on a suitable disposal system.

(b) Not be conveyed to or dumped in or on a suitable disposal system in any other way than by means of a pipeline, cement ditches or in a container.

(c) Not be dumped so that a water source is or may be polluted by it.

(d) Not constitute a nuisance or cause a condition that is a health hazard.

SANS 10049

7.2.4.3 Drainage channels shall be of the open type with, where necessary, removable covers, and shall be designed to cope with the maximum expected flow of liquid without overflowing or causing flooding.

7.2.4.4 There shall be no installations in a drainage channel that could obstruct the flow of water or the activities of cleaning. Floors and drains shall be maintained in a good condition and repair.

7.2.4.5 Floor drains or channels shall be of hygienic design suitable to the operations of the food-handling organisation and shall be discharged appropriately. Floor drains or channels shall be covered appropriately, allowing easy removal for frequent cleaning and maintenance.

7.2.4.6 Drains shall be vented to atmosphere, outside the food-handling areas, before entering the sewer or joining any sewer. A water trap shall be provided between the vent and the main sewer.

7.2.1.8 Sewage and effluent lines shall be constructed in such a manner to avoid the contamination of potable water supplies, of food handling areas and of the food product.

7.2.15 Waste facilities

Separate, suitable waste facilities shall be provided on the premises, at appropriate locations outside the building of the food-handling organisation, and shall be cleaned daily. These facilities shall be for the discharge

ing and disposal of waste, and shall prevent the contamination of the environment and of the food-handling areas. The design of these facilities shall be made to prevent contamination.

8.6.8 Waste shall be so stored to avoid the contamination of food or the environment. This waste shall be safely removed from the food-handling areas as soon as possible.

1.5.1 Hazardous waste

Hazardous waste may include pesticides, cleaning chemical containers, medicine containers and needles. The hazardous waste should be disposed of in such a manner that no humans or animals will be harmed or that the environment will not be contaminated. Needles need to be stored in a dedicated and clearly marked container which needs to be disposed of at a veterinary office or clinic.



SANS 10049

7.4.6.3 The food-handling organisation shall establish emergency procedures for dealing with the accidental contamination of food, personnel and the environment as a result of spillage of hazardous substances during handling.

7.4.6.5 Hazardous substances shall be disposed of in an environmentally appropriate manner and shall be disposed of after consultation with the relevant health authorities, and in accordance with the relevant requirements of the relevant national legislation.

1.6 WATER

Water is a universal cleaning agent and comes into contact with all the milk contact surfaces. The quality of water is therefore of the utmost importance and effective measures should be implemented to ensure that it is free from contaminants. Water tests should be done at least quarterly until the water complies with the specifications in SANS 241, and thereafter annual tests will be sufficient. Two consecutive results need to comply. Borehole, river and canal water should be tested more frequently.

Regulation R961:

"Water" means water that complies with the microbiological requirements set out in SANS 241.

An ample supply of clean water that is free from any substance that might be detrimental to human health and that is adequately protected from contamination, must be available at the point of use. The water should comply with the requirements of SANS 241. The microbiological and chemical quality of all water used in milking sheds shall be checked regularly and the results shall be recorded. Where water is chlorinated on site, a

routine checking procedure should be implemented and the results recorded.



Storage tanks and reservoirs for water should be covered to preclude the contamination of water by birds, rodents, organic and inorganic matter, and should be inspected weekly. The air vents to these tanks and reservoirs should be insect- and rodent-proof.

Flexible hoses, if used, should be suitable for food use, e.g. made of food grade material, should not be immersed in liquids unless designed for this purpose and, if immersed, should be included in the cleaning programme. When not in use, it should be properly stored on a reel or equivalent.

SANS 10049

7.2.1.8 Sewage and effluent lines shall be constructed to avoid the contamination of potable water supplies, food-handling areas, food ingredients and the food product.

7.4.1.2 Every food-handling area shall have an adequate supply of clean potable water that is free from suspended matter and substances that could be deleterious to the food product or harmful to health. Non-potable water shall have a separate, identified system that is not connected to and is prevented from reflux into the potable water system.

7.4.1.4 Flexible water hoses shall be made of a suitable material for food safety and reels for their storage shall be provided.

7.4.1.7 Where filters are used, they shall be effectively maintained in a hygienic manner.

1.7 PROTECTION OF THE ENVIRONMENT

Activities in and around the milking shed, particularly in relation to water and waste management, should be in accordance with any regulations or guidelines in order to protect the environment.

SANS 241-1

This is water that contains no *Escherichia coli* organisms per 100ml, ≤ 10 coliforms per 100ml and is free from any substance in concentrations detrimental to human health.

Effluent must be managed to ensure appropriate disposal with no contamination of water sources. If dairy effluent is applied to pasture, e.g. through irrigation, it must be done under a suitable, documented management plan. There must be at least 21 days between application and grazing or harvesting of feed. The milking animals and the farm dairy environment must not be exposed to spray drift when effluent is being spray-irrigated.



According to the *FAO/IDF Guide to Good Dairy Farming Practices*, primary milk producers need to implement systems to avoid the potential for the contamination of the local environment. Storage facilities for oil, silage liquor, soiled water and other polluting substances must be located in a safe place and precautions must be taken to ensure that accidents do not result in the pollution of local water supplies.

Measures include:

- Avoid disposing of agricultural or veterinary chemicals where there is potential of it entering the local environment.
- Protect the environment by only using approved agricultural and veterinary chemicals and medicines according to the directions on the label.
- Ensure the safe and secure storage of farm chemicals, preferably away from the milk storage areas.
- Ensure the safe disposal of expired and defunctive chemicals and chemical containers.
- Apply integrated pest management practices where appropriate.
- Apply fertilisers in a manner that minimises the risks of off-site nutrient impacts.
- Avoid using fertilisers that contain toxins, heavy metals or other contaminants.
- Ensure the safe disposal or reuse of empty fertiliser bags.

Milk production should be managed in balance with the environment surrounding the milking shed and farm.

Everybody knows what's made from cow's milk.

But nobody knows how to package it better than us.

At Polyoak Packaging, we provide a full dairy packaging solution to most of the country's leading dairies and retailers.

Our vast range of quality products and technical expertise coupled with outstanding customer service nationwide make us the most suited packaging company for you to partner with.



SPECIALIST POLYOAK PACKAGING DIVISIONS:

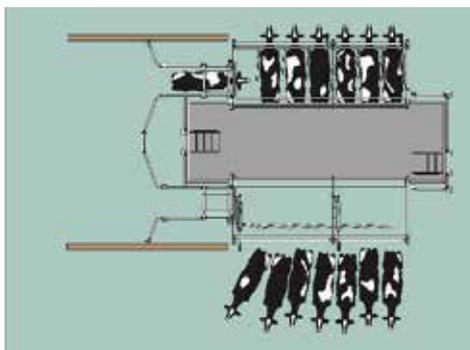
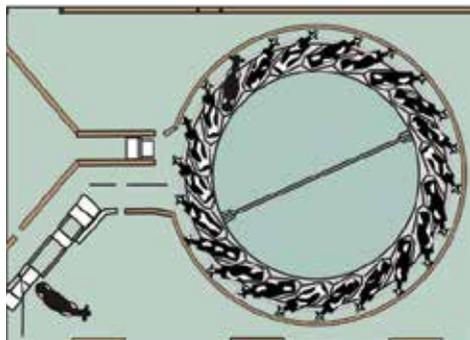
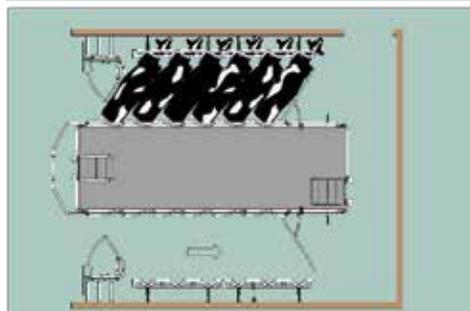
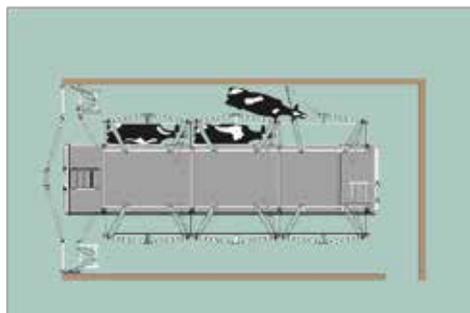
- Plastic packaging for dairy beverages, juices and traditional beer
- Thin-walled containers for dips, spreads and other food markets
- Half and standard duty crates for the dairy and the 12 juice markets
- PEZ profiles and closures for the beverage, food and wine markets
- Plastic closures for beverages, food and industrial applications

GOOD DAIRY FARMING PRACTICES

ENVIRONMENT		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
Implement an environmentally sustainable farming system.	<ul style="list-style-type: none"> • Use farm inputs such as water and nutrients efficiently and sustainably. • Minimise the production of environmental pollutants from dairy farming. • Manage livestock to minimise adverse environmental impacts. • Select and use energy resources appropriately. 	Dairy farming practices meet statutory, environmental and community expectations.
Have an appropriate waste management system.	<ul style="list-style-type: none"> • Implement practices to reduce, reuse or recycle farm waste as appropriate. • Manage the storage and disposal of wastes to minimise environmental impacts. • Manage pastures to avoid water sources being contaminated by effluent. • Implement appropriate waste management for hazardous waste. 	<p>Limit the potential impact of dairy farming practices on the environment.</p> <p>Dairy farming practices comply with relevant regulations.</p>
Ensure that dairy farming practices do not have an adverse impact on the local environment.	<ul style="list-style-type: none"> • Manage dairy effluent on-farm. • Use chemicals (agricultural and veterinary chemicals, fertilisers, pesticides, etc.) appropriately to avoid contamination of the local environment. • Ensure that the overall dairy-ing operation is appropriate for a facility in which high quality and safe milk is produced. 	<p>Minimise the impact of milk production on the local environment.</p> <p>Present a positive image of dairy farming.</p>

2: REQUIREMENTS FOR THE MILKING PARLOUR

The milking parlour is the area where the dairy animals are milked. Although the design will vary between the different milking sheds, the requirements in Regulation R961 need to be complied with.



Structures need to be visibly clean without accumulated dirt, manure or feed. It shall be clear of products, chemical substances or other items not used daily in the parlour.

2.1 STRUCTURE

All measures to ensure good hygiene practices and to prevent contamination of milking equipment and milk, need to be taken. Structural design should provide for smoothly finished, non-absorbing and corrosion-resistant material, and must be free of any open seams and cracks. Design should also facilitate easy and effective cleaning to prevent unnecessary dirt, e.g. dust and manure, from accumulating.

Adequate standing room for animals with provision for the effective removal of effluent shall be in place. The milking parlour shall not have any direct connection with a room where gases, smoke, vapours, dust or a soot deposit are present or may originate, e.g. an emergency generator, diesel fumes, poison rooms or feed mixers.

A systematic approach between the structure of the parlour, equipment used and practices followed by personnel needs to be implemented to ensure the hygienic and safe production of milk.

REGULATION R961

6. (2) In the case of a milking parlour:
 - (a) There shall be no direct connection with a latrine or with a room where gases, smoke,

vapours, dust or soot deposit are present or may originate owing to the nature of the activities in such a room.

(b) When providing standing room of more than one row of dairy stock parallel with one another, there shall be a dividing corridor of at least one metre wide between the rows.

(c) The partitions, if any, that separate dairy stock from each other when they are being milked, shall be of smoothly finished, non-absorbing and corrosion-resistant material, free of any open seams and cracks.

(d) Mangers shall be arranged so that fodder which accumulates behind the mangers can be removed and be disposed of appropriately.

(e) Where walls are provided, the exterior walls:

- (i) Shall be at least 2,4 metres high on the inside.
- (ii) Shall, at places where dairy stock are milked, extend to at least 2,1 metres above the level on which the dairy stock stand.

SANS 10049

7.2.1.1 The location of the food-handling organisation shall be such that the buildings can be kept acceptably free from objectionable odours, smoke, dust and any other sources of contamination, in order to comply with the relevant national legislation for hygiene.

ISO/TS 22002-3

5.3 (e) Construct buildings with non-toxic and cleanable materials.

2.1.1 WALLS, OVERHEAD STRUCTURES AND FLOORS

Acceptable wall finishes include sealed surfaces such as:

- Undamaged, close-fitting plastic sheeting.
- Non-flaking painted finishes.
- Good quality, sealed, cement rendering.

- The door leading from the parlour to the milk room must be clean (parlour side).

Regulation R961:

“adequately ventilated and illuminated” means ventilated and illuminated by means of windows with an uninterrupted transparent area equal to at least ten percent of the floor area and with an area which can be opened equal to at least 5 percent of the floor area and so placed that cross ventilation is facilitated.

REGULATION R961

6. (2) In the case of a milking parlour:

(f) The interior surfaces of the walls, if provided, shall be made of impervious materials with no toxic effect in intended use.

(g) The ceilings, if provided, or overhead structures and fixtures shall be constructed and finished to minimise the build-up of dirt and condensation, and the shedding of particles.

(h) The floors shall be constructed to allow adequate drainage and cleaning.

(j) Such parlour shall be provided with at least one water tap with running water to which a flexible pipe may be connected for washing purposes.

(k) The entrances and exits for dairy stock shall have a floor covering with an impenetrable surface connected to a disposal system, and this floor covering shall be installed in such a way that any milk animal entering or leaving the milking parlour shall walk on it for a distance of at least four metres.

6. (10) As soon as milk animals have left a milking shed, all manure shall be removed from the milking shed and from the floor, and all entrances and exits of the milking shed shall be cleaned.

SANS 10049

7.2.4.5 Floor drains or channels shall be of hygienic design suitable to the operations of

the food-handling organisation and shall be discharged appropriately. Floor drains or channels shall be covered appropriately, allowing easy removal for frequent cleaning and maintenance.

2.1.2 LIGHTING AND VENTILATION

SANS 10049

7.2.7.1 The ventilation shall ensure adequate circulation of air, remove excess water vapour and prevent the build-up of excessive heat, the formation of condensate and the growth of mould. Natural ventilation shall be augmented, where necessary, by mechanical means.

ISO/TS 22002-3

5.3 (d) Design buildings in accordance with the required level of hygiene, by providing adequate ventilation, lighting and cleanability, to minimise the exposure of food-producing animals and their products to contaminants and pests.

The design of the milking parlour shall provide protection from the wind and draughts, but shall allow adequate ventilation. The parlour shall be adequately lit and lighting levels in the parlour should be of such a level to permit:

- The reading of tag numbers or freeze brands.
- Allow for the milk to be inspected.

All lights shall be in a working condition and shall be regularly cleaned. Lights shall be fitted with protective covers when breakage may cause a safety hazard, e.g. above feed or basins.

REGULATION R961

6. (2) In the case of a milking parlour:
(i) Such parlour shall be adequately ventilated and illuminated.

2.1.3 DRAINAGE AND EFFLUENT HANDLING

Effective drainage and removal of liquid and solid waste from the milking parlour is essential in preventing disease transmission and

controlling pests. Micro-organisms in manure may lead to mastitis or may contaminate the milk. All entrances, exits and gathering points near the milking parlour also have to be free of accumulated manure.

Regulation R961

6. (2)(d) Mangers shall be arranged so that fodder which accumulates behind the mangers can be removed and be disposed of appropriately.

(h) The floors shall be constructed to allow adequate drainage and cleaning.

(5) Any effluent originating from a milking shed shall:

(a) Not be stored, treated or dumped in any place except in or on a suitable disposal system.

(b) Not be conveyed to or dumped in or on a suitable disposal system in any other way than by means of a pipeline, cement ditches or in a container.

(c) Not be dumped so that a water source is or may be polluted by it.

(d) Not constitute a nuisance or cause a condition that is a health hazard.

Regulation R961:

“Effluent means any liquid, liquid or solid waste or liquid or solid manure emanating from a milking shed.

Regulation R961:

“Disposal system” means a subterranean or ground-level tank or other vessel, sewerage system, dam or farmland into or onto which effluent maybe discharged.

SANS 10049

7.2.4.5 Floor drains or channels shall be of hygienic design suitable to the operations of the food-handling organisation and shall be discharged appropriately. Floor drains or channels shall be covered appropriately, allowing

easy removal for frequent cleaning and maintenance.

ISO/TS 22002-3

5.3 (k) Design and equip facilities to collect and maintain away from animals and foods the effluents and waste waters that may result in food contamination.

2.1.4 PEST PREVENTION

Pests such as insects and rodents are known vectors for the introduction of human and animal diseases into the production environment. Measures implemented should emphasise pest prevention.



All efforts should be made to minimise the presence of insects, rats and mice. Although milking parlours attract such pests, good preventive measures such as proper building construction and maintenance, cleaning, removal of waste and manure can minimise the presence of pests. Manure accumulations should not be allowed to develop close to milking areas. Mice and rats are also attracted to animal feed stores, therefore any such feed stores should be located at a suitable place and feed kept in containers that provide adequate protection against such pests.

If it is necessary to resort to chemical pest control measures, such products should be approved for use on food premises and used in accordance with the manufacturer's instructions. Any pest control chemical should be stored in a manner that will not contaminate the milk or 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. No pesticides should be applied during milking.

Pest control measures may be physical, chemical or biological.

SANS 10049

7.4.8.1 An effective pest control programme that is not limited to pest control chemicals shall be documented and implemented. All food-handling areas shall be pest-free.

7.4.8.3 Only registered pesticides shall be used in accordance with the manufacturer's instructions and shall only be applied by a pest control operator that is suitably qualified and trained. The current certified copy of the pest control operator's qualification shall be held by the food-handling organisation.

7.4.8.4 Pesticides and cleaning chemicals shall at no time be allowed to come into contact with wrapping material, containers, raw materials or the food product. Insecticides and rodenticides that look similar to the food being handled, or are in similar containers to these used for packaging, shall not be used.

7.4.8.5 The room in which pesticides are stored shall be kept locked and the materials contained in it shall only be handled by employees trained in their use.

7.4.8.6 Bait stations shall be of a lockable type, and shall not be placed in food-handling areas where food could be contaminated.

ISO/TS 22001-3

5.11 Pest control on farm premises

When pest access and proliferation on the farm can result in contamination of food, the organisation shall establish and maintain a pest control system to monitor and control pest access and proliferation on the farm in a

manner that does not result in contamination of food with pest remains or anti-pest substances.

Only pest control chemicals that are authorised by the competent authority shall be used. These products shall not come into contact with food and feed products or livestock.

Pest control chemicals shall be used following the manufacturer's instructions and their effectiveness shall be verified by visual inspection of premises.

The parlour should be bird- and vermin-free

Ideally steps should be taken to prevent the entry of birds and vermin. However, it is necessary to recognise the difficulties that farmers may have in attaining these standards where the parlour is part of an integrated system.

Birds, fowls and poultry

The following should be considered:

- Feed hoppers should be kept clean and covered.
- Removal of nests from overhead structures in the milking parlour.
- Domestic fowl or poultry should not be allowed entry to the parlour area.

Vermin

The focus should be on the elimination of entry points:

- Drains/drain pipes.
- False ceilings.
- Pipelines from the parlour to the milk room.
- Wiring holes.

The following factors should also be addressed:

- Support rails from the parlour to the tank room should be inspected for the presence of small gaps that may permit the entry of vermin into the bulk tank room.
- Be on the lookout for evidence of a problem, e.g. rat droppings.

- Implement an effective vermin control/pest control programme.
- Clean the milking parlour after milking.

Records of bait-changing dates may be used to confirm the implementation of a dairy farmer's vermin control programmes. Farmers may contact a private pest control company for information.

Insect control and prevention

The area surrounding the milking parlour should be kept clean and the grass short, to limit breeding and hiding places for insects and other pests. Effective manure handling should be adhered to.

Fans, fly strips, sprays or insect electrocutors will assist in the control of insects. Measures may include the use of:

- Fly sprays – these insecticides should be approved for use in food premises.
- Fly strips – replaced regularly.
- An insect electrocutor.

REGULATION R961

6. (6) A holder shall see to it that:

(a) In or at a milking shed:

- (i) A nuisance or a condition that is a health hazard is not caused or does not arise.
- (ii) No poisonous or hazardous substances or gases are stored.
- (iii) No activity is carried out which can pollute, harm, contaminate or spoil the milk.
- (iv) Appropriate storage conditions to avoid feed contamination.

(b) Rodents and flies, cockroaches and other insects on the premises of the milking shed are controlled.



(9) No person shall smoke, use or handle tobacco in any form or eat in a milking shed, except in the change room or dining room of a milking shed.

Security is important on farms, but guard dogs will only be allowed in the milking parlour.

All milking equipment shall be clean and disinfected before being used. If mobile milking equipment is used, this may mean cleaning between each use.

2.2 MILKING EQUIPMENT

Milking equipment is not limited to milking machines, buckets or cans, but includes all equipment used in the milking parlour, e.g. hoses.

Materials used for milking equipment that come into contact with milk, and with cleaning and disinfecting agents, should be made from adequately resistant and food grade materials. Manufacturers' recommendations should be followed for construction, installation, performance and maintenance of the equipment used for milking.



SANS 10049

7.3.1.2 All food-handling equipment and uten-

sils that come into contact with the food shall be smooth-surfaced, light-coloured and of a suitable corrosion-resistant, non-absorbent material coated surface suitable for use with food, but should preferably be made of stainless steel.

7.3.1.3 The materials, design and construction of machinery and equipment, including hoses, shall be suitable for food-handling processes and shall prevent the contamination of the food product during operations. The materials, design and construction of machinery and equipment shall also be suitable for their intended use.

7.3.1.4 The equipment and utensils for food handling shall be of hygienic design with no open joints or crevices and shall be constructed to facilitate their cleaning and disinfection. The food-handling organisation and its equipment shall be designed to facilitate the cleaning and disinfection of the areas under such equipment. Open ends and curled edges shall be satisfactorily sealed to prevent the accumulation of organic material and dirt. Where necessary, as in the case of equipment that cannot be cleaned *in situ*, it shall be possible to dismantle the equipment for cleaning and disinfection.

7.3.1.6 The design and materials of food contact surfaces shall be hygienic and, where applicable, shall take the following into consideration:

- a) Surface texture.
- b) Cleaning and inspection.
- c) Disinfection, pasteurisation and sterilisation.
- d) Microbial ingress.
- e) Draining.
- f) Dead spaces.
- g) Joints.
- h) Coatings.
- i) Internal angles.
- j) Corners and grooves.
- k) Seals and gaskets.
- l) O-rings and joint-rings.

- m) Fasteners.
- n) Intrusions.
- o) Sensor, sensor connections and other connections.
- p) Shafts and bearings.
- q) Openings and covers.

7.3.1.7 The design and construction of food contact surfaces and non-food contact surfaces shall be appropriate to the requirements of the food-handling process and shall be cleanable. These surfaces shall prevent ingress of moisture and, where necessary, shall be capable of being disinfected. Permanent metal-to-metal or non-metal joints shall be continuously welded or bonded to prevent ingress of unwanted material.

7.3.1.8 Equipment shall be designed, fabricated and installed to prevent the ingress of unwanted fluids (for example, lubricating and hydraulic fluids, as well as signal transfer liquids) into the food product. Where equipment failure can result in these fluids coming into contact with the food product, these fluids shall be non-toxic and compatible with the food product.

7.3.1.9 All parts of stationary equipment or equipment that is not readily movable shall be installed away from the walls and ceilings at distances sufficient to allow access for cleaning and inspection. All permanently mounted equipment shall be either installed high enough above the floor to allow access for cleaning and inspection, or shall be completely sealed to the floor.

7.3.1.11 Copper, lead and their alloys (other than solder), and other metals or materials detrimental to health, shall not be used in the construction of equipment that comes into contact with the raw materials or with the unprotected food at any stage of its handling.

7.3.1.13 The use of solder in equipment shall be minimised.

ISO/TS 22002-3

5.4 Equipment suitability and maintenance

The organisation shall design, install and use equipment in such a way to maintain an appropriate degree of hygiene. Equipment shall not itself constitute a source of food contamination.

The organisation shall install and use equipment in accordance with the conditions of use provided by the manufacturer or, if not available, technical standards.

Depending on the operations and where appropriate to minimise the likelihood of food contamination, examples of PRPs that should be implemented are to:

- a) Use food contact equipment (e.g. a milk tank) that is:
 - 1) Made of materials that do not increase the likelihood of chemical contamination of foods.
 - 2) Designed to allow appropriate sanitary inspection, cleaning and, if necessary, disinfection.
 - 3) Designed to allow complete drainage and, where necessary, the prevention of post-disinfection contamination from the environment.

REGULATION R961

Milk containers and milking machine

7. (1) A milk container shall:

- (a) Be designed and constructed in such a way that it has a smooth finish, free from open seams, cracks and rust stains to ensure that, where necessary, it can be adequately cleaned, disinfected and maintained to avoid the contamination of milk.
- (b) Not be made wholly or partly of copper, or any copper alloy or any toxic material.
- (c) Be constructed in such a way that any surface that comes into contact with milk is accessible for the purpose of washing and disinfection.

(d) Not be used for any other purpose except the handling of milk.

(2) A milking machine shall:

(a) Be designed, constructed or manufactured in such a way that:

(i) The vacuum pipe of the machine can be drained to remove all the moisture.

(ii) It can be adequately cleaned, disinfected and maintained to avoid the contamination of milk.

(iii) It is equipped with a device rendering visible the milk flow from each milk animal.

(iv) It complies with sub-regulation (1) (a), (b), (c) and (d).

(b) It is durable and movable or capable of being disassembled to allow for maintenance, cleaning, disinfection, monitoring and to facilitate inspection.

2.2.1 Maintenance of equipment

Milking equipment should be well-maintained, inspected and regularly serviced. Regular testing and maintenance of milking equipment are essential to maintain good mechanical performance. Inspect and replace perishable components if evidence of wear is found.

The teat cup liners need to be in an excellent condition, e.g. not perished and without cracks, to avoid build-up of micro-organisms.

Monitor and check milking equipment on a regular basis and if continuous problems are experienced, e.g. with high bacterial counts, somatic cell counts or herd health, the manufacturer or service provider needs to be contacted for a service on the milking machine. Damaged or poorly maintained milking equipment may lead to poor milking practices and may negatively impact on animal well-being and production.

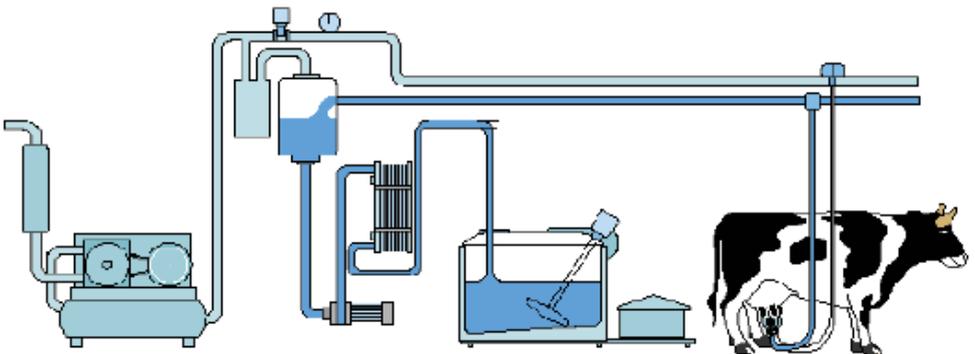
A pre-planned maintenance schedule should be available to ensure regular maintenance on all equipment and to ensure optimum conditions. Internal as well as external maintenance need to be recorded. One of the major problems for primary producers who perform much of the maintenance themselves, is that it is often not performed on time and may eventually be skipped altogether.

The milking machine and components shall be serviced at least once a year by a specialist or trained technician who shall examine, at least, the vacuum level, pulse frequency and state of the rubbers. The adjustment of the machine must allow the respect of the norms.

REGULATION R961

(2) A milking machine shall:

(a) (ii) Be adequately cleaned, disinfected and maintained to avoid the contamination of milk.



SANS 10049

7.3.2 Maintenance of equipment

7.3.2.1 An effective maintenance programme shall be implemented to ensure the hygienic integrity and proper functioning of buildings (both interior and exterior), equipment, vehicles and services.

7.3.2.2 Equipment that is critical to food safety shall be identified and an appropriate maintenance programme implemented. Records of maintenance shall be kept by the food-handling organisation.

7.3.2.3 Maintenance shall be carried out by suitably trained personnel that are equipped with the correct tools maintained in an appropriate hygienic state.

7.3.2.4 Maintenance activities shall not cause any form of contamination to the food-handling materials or to the food.

ISO/TS 22002-3

5.4 Equipment suitability and maintenance

b) Verify, calibrate, maintain or replace equipment regularly, and, in all cases, in accordance with the manufacturer's instructions.

Information supplied by the manufacturer of a milking machine should include:

- Vacuum level at the regulator or vacuum gauge.
- Milking vacuum level (average vacuum in the claw at peak milk flow).
- Pulsator rate and ratio with a check of each pulsator.
- Effective and manual reserve airflow.
- Air injector timing.
- Water flow rate through each milking unit during the wash cycle.
- Recommended cycles for cleaning.
- Recommended chemical concentrations for each cycle.

Proposed maintenance checks

All checks need to be performed according to the manufacturer's instructions.

Frequency	Daily	Weekly	6 - 12 Monthly	Routine actions/ replacements
Checks	<ul style="list-style-type: none"> • Vacuum regulator operating properly. • Vacuum level at desired level. • Check for air leaks in liners and hoses. • Pulsators operating properly. • Check that air admission hole in each claw is open. 	<ul style="list-style-type: none"> • Clean vacuum regulator. • Ensure vacuum pump oil level is satisfactory. • Check belt tension and belt condition on vacuum pump. • Check lines, couplings and inlets for leaks. • Clean air filters. • Clean interceptor, check seal and drain plug. 	<ul style="list-style-type: none"> • All other service checks as specified by the manufacturer. • Service by a technical competent person. 	<ul style="list-style-type: none"> • Replace milking machine liners. • Replace long milk tubes. • Replace long pulse tubes, rubber elbows and connectors when damaged. • Break down pipelines and connections, e.g. check for milk stone. • Hand-clean problem areas and re-evaluate cleaning procedure.

2.2.2 Cleaning and disinfection

The hygienic quality of milk affects the quality and safety aspects of the end-product and the health of the consumer. The primary producer has the responsibility to produce milk under clean and hygienic conditions, employing approved techniques and procedures to clean and disinfect the milking parlour and milking equipment.

Cleaning and disinfection are complementary processes: Neither process alone will achieve the desired end-result. Milk with low bacterial and somatic cell counts cannot be produced unless milking equipment is effectively cleaned and disinfected between milkings. Relatively simple and inexpensive cleaning and disinfection procedures can effectively remove and prevent milk contact surfaces as a source of contamination.

The cleaning and disinfection routine of milking machines may differ because of the different manufacturers and suppliers of cleaning chemicals. It is best to consult with the supplier of clean-

ing chemicals and the machine manufacturer to compose the best cleaning routine for each specific milking parlour and equipment. It is thus of utmost importance to use a reliable supplier of cleaning chemicals that will offer this very important service.

The supplier of cleaning chemicals should assist in supplying and implementing cleaning and disinfection programmes as well as material safety data sheets for each product in their range.

The following should be available:

- Sufficient hot running water to facilitate cleaning for the size of the milking machine.
- Cleaning chemicals and disinfectants must be registered by the SABS.
- A documented cleaning procedure for the milking machine.
- A documented cleaning procedure for manual cleaning.
- Clearly marked cleaning equipment for the milking parlour.



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GOOD DAIRY FARMING PRACTICES

MILKING PARLOUR		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
<p>Ensure that the milking parlour structure promotes hygiene.</p>	<ul style="list-style-type: none"> • Ensure that structures are made from smooth-finished, non-absorbing and resistant-free material. • Ensure that structures are well-maintained and cleaned. • Implement effective pest control. • Ensure that the structures adhere to the requirements of regulation R961. 	<p>Dairy farming practices meet all regulatory and industry requirements.</p>
<p>Ensure milking is carried out under hygienic conditions.</p>	<ul style="list-style-type: none"> • Implement an effective drainage and effluent disposal system. • Ensure a sufficient supply of clean water. • Ensure the milking parlour area is clean and tidy. • Ensure milking equipment is correctly installed and maintained. • Ensure milking equipment is cleaned and disinfected after each milking. • Ensure that all milking equipment is constructed of food grade materials. • Ensure that personnel hygiene is adhered to. • Implement effective security at the milk room. 	<p>Limit the potential negative impact of dairy farming practices in the milking parlour.</p> <p>Dairy farming practices comply with relevant regulations.</p>

3. GENERAL REQUIREMENTS FOR THE MILK ROOM

The milk room is also known as the bulk tank room and is the area where the milk is stored and cooled after milking. It should only be used for the cooling and storage of milk, and for cleaning and storing milking utensils. All other activities, including storage of any chemicals or veterinary medicine, associated with the milking operation should be performed in other areas. The location of the milk room must allow easy access to the milking operations and the milk tanker.



Although the design will vary toward the different milking sheds, the requirements in regulation R961 need to be complied with. The milk tank room shall not have a direct connection with any room where gases, smoke, vapours, dust or a soot deposit are present or may originate, e.g. the milking machine pump, emergency generator, diesel fumes, poison rooms and feed mixers.

A systematic approach towards the structure of the milk room, equipment used and practices followed by personnel, needs to be implemented to ensure the hygienic and safe production of milk.

A dedicated and accessible hand-washing and drying facility shall be available in the milk room, e.g. basin, antibacterial soap and paper towels.

Structures need to be visibly clean without accumulated dirt, manure or feed. The milk room shall be pest-proofed and clear of products, chemical substances or other items not used daily in the milk room.



3.1 STRUCTURE

Take all measures necessary to ensure good hygiene practices and to prevent contamination. Structures made from a smoothly finished, non-absorbing and corrosion-resistant material that are free of any open seams and cracks, will assist in effective cleaning and unnecessary dirt accumulation.

REGULATION R961

6. (3) In the case of a milking room:

(a) Such milking room shall comply *mutatis mutandis* with the provisions of sub-regulation (2 (e), (i), (f), (g), (h) and (i).

(d) Such milking room shall be erected so that a milk tanker can be connected to a bulk farm tank through a suitable opening and the distance between the two connection points shall not exceed six metres.

(e) Such milking room shall be rodent-proof.

(f) The doors should have smooth, non-absorbent surfaces, and should be easy to clean and, where necessary, disinfected.

(g) Windows should be easy to clean, be constructed to minimise the build-up of dirt and, where necessary, be fitted with removable and cleanable insect-proof screens. Where necessary, windows should be fixed.

(h) Such milking room may be equipped with a farm tank referred to in regulation 7(3) for the storage of milk.

3.1.1 Milking parlour and milk room

The milking parlour and milk room shall be physically separated by a closed door. During milking this door shall be kept closed. The following factors shall be addressed:

- The door shall be undamaged and well-fitting.
- Soundness of the door surface.
- Well-maintained wooden surfaces are acceptable.

The door separating the milking parlour and the milk room shall be locked when unattend-

ed or at night if the milk room is not otherwise secured from the parlour entrance, e.g. if the parlour itself is not secured from the outside.

3.1.2 Scullery

Provision shall be made for the cleaning of containers and unfixing apparatus and equipment which shall prevent possible cross-contamination.

REGULATION R961

6. (1) (a) (iv) A scullery for the washing, cleaning, disinfection and sterilisation of milk containers and other unfixing apparatus and equipment should be used in the handling of milk.

(3) In the case of a milking room:

(b) Where the scullery forms an integral part of the milking room as referred to in sub-regulation (1) (b) (ii), there shall be sufficient space to allow for the cleaning and disinfection of all milk containers and the storage of milk.

(c) Such milking room shall be provided with at least one sink, with hot and cold water (or temperature-controlled water), and running water with the run-off connected to a disposal system.

3.1.3 Doors, walls and floors

Doors and walls must be complete and undamaged with a washable finish. Acceptable finishes include any sealed surfaces such as:

- Good quality, sealed, cement rendering.
- Non-flaking painted finishes.
- Tiles used shall be well-maintained and sealed, grouting must be sealed properly.
- Undamaged, close-fitting plastic sheeting.
- Painted or galvanised doors.
- The door leading from the milk room to the parlour must be clean on the milk room side.

Milk room (bulk tank room) walls shall be well-maintained, undamaged and shall be covered by a washable, sealed surface.

Attention shall be paid to any lintels around the entrance to the milk room as these are often permeable. Dirt and mould shall not be allowed to accumulate. The hose port or hose pipe opening used during milk collection, must be located in an exterior wall and fitted with a tight self-closing door.

REGULATION R961

6. (2) (e) The exterior walls:

(i) Shall be at least 2,4 metres high on the inside.

(f) The interior surfaces of the walls, if provided, shall be made of impervious materials with no toxic effect in intended use.

SANS 10049

7.2.3.7 Doors and door frames shall be sheathed with, or made from, a suitable corrosion-resistant material and shall have a smooth seamless, light-coloured, water-impermeable and readily cleanable surface. If wood is used, it shall be sheathed to render it impermeable to water. Doors and their frames shall be of a material and construction which meets the same functional requirements as internal walls.

7.2.3.9 Doors shall be rodent-proof and tight fitting.

7.2.3.10 All doors that open directly from the outside into the food-handling areas shall be provided with effective screens or shall, as far as it is practical, be self-closing and tight-fitting.

7.2.3.11 External doors shall be so constructed to prevent the entry of rainwater into the food-handling areas and shall be kept closed when not in use.

Floors shall be well-maintained and effectively sloped to ensure effective drainage. Standing water will lead to the growth of unwanted mi-

croorganisms. Damaged and uneven floors will negatively impact on dust and pest prevention as well as adequate cleaning.

REGULATION R961

6. (2) (h) The floors shall be constructed to allow adequate drainage and cleaning.

SANS 10049

7.2.4 Floors and drainage

7.2.4.1 Floors shall be constructed of concrete or any other material that is water-impermeable, corrosion-resistant and easy to clean, and shall be laid to an even surface that is smooth but not slippery, and is free from cracks, crevices and open joints.

7.2.4.2 Floors in the food-handling areas shall be suitably sloped and shall drain into external gullies, sumps and sewers. Each outlet shall have, immediately outside the walls of the food-handling area, a trap that prevents the entry of rodents.

7.2.4.4 Floors and drains shall be maintained in a good condition and repair.

7.2.4.5 Floor drains or channels shall be of hygienic design suitable to the operations of the food-handling organisation and shall be discharged appropriately. Floor drains or channels shall be covered appropriately, allowing easy removal for frequent cleaning and maintenance.

7.2.4.8 In food-handling areas, joints between walls, ceilings and floors shall be covered and appropriately sealed.

3.1.4 Ceilings, roofs and overhead structures

Ceilings, roof linings, girders and/or beams shall be designed and maintained to minimise the accumulation of dirt and dust and any risk of creating space for vermin.

Attention must be paid to false ceilings. These

are a potential source of dust and can provide vermin with an entry point into the storage room. There should be no gaps in ceilings or around pipelines entering the milk room.

Ceilings must be visibly clean (e.g. free from mould, cobwebs and fly excretions). Beams and girders shall be free from rust and dust.

REGULATION R961

6. (2) (f) The ceilings, if provided, or overhead structures and fixtures shall be constructed and finished to minimise the build-up of dirt and condensation, and the shedding of particles.

SANS 10049

7.2.2.1 Roofs shall be weatherproof and made of non-absorbent material, and shall be well-maintained to prevent the contamination of the food product and to prevent other structures from becoming damp.

7.2.2.2 Roofs and, where applicable, ceilings, shall fit tightly to the walls and shall be at least 2,4m above the floor. In the food-handling areas, the roof and, where applicable, the ceiling, shall be at least 300mm above any equipment and high enough to allow the free movement of mobile equipment and moving parts of other equipment.

7.2.2.3 The ceiling (or where no ceiling is provided, the roof) shall be dustproof and faced with a suitable corrosion-resistant, light-coloured and impermeable material that is constructed and finished to minimise condensation, mould development, flaking of paint and the lodgement and accumulation of dirt, and shall be capable of being cleaned without damage.

7.2.2.4 Where there is no access to the space above the ceiling, the ceiling shall be totally sealed. Openings in ceilings for conveyors, vents, piping, etc. shall be smooth and sealed.

3.1.5 Windows

Windows must be well-fitting, entire and weatherproof. Window frames must be free from cracks, rust, flaking paint or loose putty. Window sills must be entire and preferable sloped. All windows that are not permanently secured shall have fly screens fitted, which shall be regularly cleaned.

SANS 10049

7.2.3.3 Windows shall ideally be non-opening. Any glass windows in food-handling areas (including these used for the storage of components) shall be protected against breakage.

7.2.7.5 In the event where windows have been previously designed to be opened for ventilation purposes, they shall be appropriately screened to prevent the ingress of pests. The screens shall be easily removable for cleaning and shall be made from a suitable corrosion-resistant material and kept in good repair.

3.1.6 Lighting and ventilation

Regulation R961:

“Adequately ventilated and illuminated” means ventilated and illuminated by means of windows with an uninterrupted transparent area equal to at least 10% of the floor area and with an area which can be opened equal to at least 5% of the floor area and placed in such a way that cross-ventilation is facilitated.

Lights shall be in a working condition and shall have protective covers to minimise the risk of contamination if glass breakage occur. Lights should, as far as possible, not be located directly above the bulk tank. Plastic covers or sleeves are acceptable and no bulbs shall be exposed. Covers shall be regularly cleaned to remove dead flies and cobwebs.

REGULATION R961

6. (2) (i) Shall be adequately ventilated and illuminated.

(6) A holder shall see to it that:

(i) A nuisance or a condition that is a health hazard is not caused or does not arise.

SANS 10049

7.2.7.1 The ventilation shall ensure adequate circulation of air, shall remove excess water vapour and shall prevent the build-up of excessive heat, the formation of condensate and the growth of mould. Natural ventilation shall be augmented, where necessary, by mechanical means.

ISO/TS 22002-3

5.3 (d) Design buildings in accordance with the required level of hygiene, by providing adequate ventilation, lighting and cleanliness, to minimise the exposure of food-producing animals and their products to contaminants and pests.

3.1.7 Pest prevention programme in the milk room

No pests shall be allowed in the milking room. Buildings shall be kept in good repair to prevent an access of pests and eliminate possible locations for their reproduction. Holes, drains and other ways rendering pests entrance shall be meticulously sealed.

The following measures should be taken:

- Doors leading to the exterior must fit tightly without any openings.
- Windows towards the exterior should be equipped with removable and washable protection fly screens.
- Pipe, drain or wire openings must be protected to avoid entrance of pests.
- The milk room must be kept clean and free from waste.

Inside the buildings all potential refuge for pests, such as holes and crevices in walls and floors, obsolete material and equipment, etc., must be eliminated. Other elements such as electrical panels, routes for pipes and cables between adjacent premises should be sealed.

The presence of food and water attracts pests and permits their reproduction. Nourishing substances and garbage must not be left unprotected, and stagnant water must be avoided. Pesticides or insecticides should not be stored in the milking room.

No cats, dogs or domestic fowl should be allowed in the milk room.



3.1.8 Security

The milk room must be kept totally secure at night or when unattended, and shall be totally inaccessible and locked. This include any doors from the parlour to the milk room that can be accessed from outside.

3.2 Milk storage and cooling equipment

All equipment must be properly located in the

milk room for easy access to all areas for cleaning, inspection and maintenance. The storage and cooling equipment will only be used for milk and no other purpose. The bulk tank must not be located over a drain. Where possible, no lights should be placed directly over the bulk tank.

SANS 10049

7.3.1.2 All food-handling equipment and utensils that come into contact with the food shall be smooth-surfaced, light-coloured and of a suitable corrosion-resistant, non-absorbent material coated surface suitable for use with food, but should preferably be made of stainless steel.

7.3.1.3 The materials, design and construction of machinery and equipment, including hoses, shall be suitable for food-handling processes and shall prevent the contamination of the food product during operations. The materials, design and construction of machinery and equipment shall also be suitable for their intended use.

7.3.1.4 The equipment and utensils for food handling shall be of hygienic design with no open joints or crevices, and shall be constructed to facilitate their cleaning and disinfection. The food-handling organisation and its equipment shall be designed to facilitate the cleaning and disinfection of the areas under such equipment. Open ends and curled edges shall be satisfactorily sealed to prevent the accumulation of organic material and dirt. Where necessary, as in the case of equipment that cannot be cleaned in situ, it will be possible to dismantle the equipment for cleaning and disinfection.

7.3.1.5 Surfaces with which the food comes into contact shall not be painted.

7.3.1.6 The design and materials of food contact surfaces shall be hygienic and, where applicable, shall take the following into consideration:

- a) Surface texture.
- b) Cleaning and inspection.
- c) Disinfection, pasteurisation and sterilisation.
- d) Microbial ingress.
- e) Draining.
- f) Dead spaces.
- g) Joints.
- h) Coatings.
- i) Internal angles.
- j) Corners and grooves.
- k) Seals and gaskets.
- l) O-rings and joint-rings.
- m) Fasteners.
- n) Intrusions.
- o) Sensor, sensor connections and other connections.
- p) Shafts and bearings.
- q) Openings and covers.

7.3.1.7 The design and construction of food contact surfaces and non-food contact surfaces shall be appropriate to the requirements of the food-handling process and shall be cleanable. These surfaces shall prevent ingress of moisture and, where necessary, shall be capable of being disinfected. Permanent metal-to-metal or non-metal joints shall be continuously welded or bonded to prevent ingress of unwanted material.

7.3.1.8 Equipment shall be designed, fabricated and installed to prevent the ingress of unwanted fluids (for example, lubricating and hydraulic fluids, as well as signal transfer liquids) into the food product. Where equipment failure can result in these fluids coming into contact with the food product, these fluids shall be non-toxic and compatible with the food product.

7.3.1.9 All parts of stationary equipment or equipment that is not readily movable shall be installed away from the walls and ceilings at distances sufficient to allow access for cleaning and inspection. All permanently mounted equipment shall be either installed high enough above the floor to allow access for cleaning and inspection, or shall be completely sealed to the floor.

7.3.1.10 Equipment shall preferably not be sunk into the floor, but if this is unavoidable, the installation of the equipment shall be such as to be acceptable. Sunken areas shall be well-drained.

7.3.1.11 Copper, lead and their alloys (other than solder), and other metals or materials detrimental to health, shall not be used in the construction of equipment that comes into contact with the raw materials or with the unprotected food at any stage of its handling.

7.3.1.12 Where applicable, equipment shall be exhausted to the outside to prevent excessive condensation.

7.3.1.13 The use of solder in equipment shall be minimised.

3.2.1 Milk containers

A milk container must be made of a material that is non-toxic and that won't tuncate the milk or taint the milk. Materials that can be used include:

- Stainless steel of an AISI 316/304.
- Aluminium (only for milk cans).

Milk containers should have a smooth finish and be free of open seams, cracks and rust stains. Seams, cracks, rust and rough surfaces act as a breeding ground for bacteria. It also prevents proper cleaning and disinfection of containers.

REGULATION R961

7. (1) A milk container shall:

- (a) Be designed and constructed in such a way that it has a smooth finish, free from open seams, cracks and rust stains, to ensure that, where necessary, it can be adequately cleaned, disinfected and maintained to avoid the contamination of milk.
- (b) Not be made wholly or partly of copper, or any copper alloy or any toxic material.
- (c) Be constructed in such a way that any surface that comes into contact with milk

is accessible for the purpose of washing and disinfection.

(d) Not be used for any other purpose except the handling of milk.

3.2.2 Bulk milk tank

The bulk tank should be designed and constructed to ensure the most hygienic conditions of milk handling, storage and cooling. According to SANS 708, stainless steel of an AISI Type 304 shall be used in the construction of a farm bulk tank. Metals for cooling coils and other components that will come into contact with water, should be such to prevent corrosion or rust. Rubber components will comply with the relevant requirements regarding to hardness, tensile strength, compression set, resistance to butter fat and steam.

Main covers for open tanks must be fitted with hinges, which shall enable it to be removed or to maintain the cover in a half-open position. The manhole should be covered in such a way that it will adequately overlap and seal the manhole. A closed tank shall be fitted with a ventilator that will ensure effective drainage and sealing of the tank.

The blades of the agitator must be welded to the shaft and the shaft must be fitted with a coupling that facilitates the removal of the agitator. There shall be a movable deflector of acceptable material that will prevent the entry of moisture and contaminants into the bulk tank. The switch of the agitator needs to be clearly visible, e.g. to the tank driver. A contents chart verified against the dipstick graduations in millimetres should be available for each bulk tank.

Each bulk tank must have an acceptable temperature-indicating device and a thermostat. The position of the temperature dial shall be such that the indicated temperature can be easily read by everyone, e.g. the tanker driver. In the case of a digital thermometer the figures shall be of at least 6mm.

The thermometer of the milk cooling tank must be calibrated on an annual basis. Verification of the thermometer can be done in collaboration with the milk buyer/processor. The use of glass and mercury thermometers is prohibited as this is a serious food safety risk.



The levelness of the tank shall be verified and the manner of mounting of the bulk tank shall be such that the mounting cannot inadvertently be disturbed.

REGULATION R961

7. (a) Be designed and constructed in such a way that it has a smooth finish, free from open seams, cracks and rust stains to ensure that, where necessary, it can be adequately cleaned, disinfected and maintained to avoid the contamination of milk.

(b) Not be made wholly or partly of copper, or any copper alloy or any toxic material.

(c) Be constructed in such a way that any surface that comes into contact with milk is accessible for the purpose of washing and disinfection.

(d) Not be used for any other purpose except the handling of milk.

7. (3) A bulk farm tank shall:

(a) Be designed, constructed or manufactured in such a way that it:

(i) Has a drainage incline leading directly to the outlet point.

(ii) Is fitted with an outlet pipe made or manufactured and fitted in a way that all liquid can drain out of such a tank, and the end of such an outlet pipe shall be screw-threaded and fitted with a screw-on cap permitting such end to be shut off.

(iii) Is fitted with an automatic operated stirring mechanism capable, within five minutes of being put into operation, mixing the milk in such a tank.

(iv) Is fitted with a thermometer capable of measuring the temperature of the milk in such a tank accurately to the nearest two degrees Celsius.

(v) Is equipped to cool the milk in such a tank to five degree Celsius or a lower temperature within three hours, and is capable of keeping such cooled milk at a required temperature of between one and five degrees Celsius effectively.

(vi) Is installed at a minimum distance of 0,5 metres from any roof, ceiling or wall to effectively keep the milk cool.

(vii) Is insulated in such a way that when no cooling takes place, the temperature of the milk in such a tank shall not increase by more than 3 degrees Celsius in twelve hours if the surrounding temperature is 32 degrees Celsius.

(c) Be able to allow for maintenance, cleaning, disinfection, monitoring and to facilitate inspection.

3.2.3 Handling and storage of milk

Immediately after milking, the milk must be stored in milk storage equipment which should be properly designed, maintained, cleaned and disinfected. Time and temperature control is important during the storage of the milk. The milk must be cooled down to <math><5^{\circ}\text{C}</math> within three hours of milking and must be kept at this temperature until milk collection. Care should be taken that the milk does not freeze.

REGULATION R961

8. (3) Milk shall not be transferred from one container to another by means of a third container.

(4) Milk shall be protected from direct sunlight.

(5) Milk shall be transferred to the milking room immediately after the stock has been milked.

(6) Except when milk is being pasteurised or undergoing some other heat treatment process, the milk shall be cooled to a temperature of 5 degrees Celsius or lower, but above freezing point and kept at that temperature until it is removed from the milking area.

3.2.4 Maintenance

The bulk tank must be included in a maintenance schedule. Internal and external maintenance will be indicated. This will include the annual calibration of the temperature-indicating devices, and may include the servicing of compressors and performance tests on the cooling system and agitators.

3.2.5 Cleaning, disinfection and cleaning equipment

Cleaning and disinfection are complementary processes: Neither process alone will achieve the desired end-result. Milk with low bacterial and somatic cell counts cannot be produced unless milking storage equipment is effectively cleaned and disinfected between milk collections. Relatively simple and inexpensive cleaning and disinfection procedures can effectively

prevent milk contact surfaces from becoming a source of contamination.

The cleaning and disinfection routine of milking storage equipment may differ because of the different manufacturers and suppliers of cleaning chemicals.

The supplier of cleaning chemicals should be an integrated part of the cleaning routine by supplying cleaning programmes and material safety data sheets for each product in their range.

Keep records of bulk tank temperatures as well as cooling times to prevent ineffective cooling.

The following must be available:

- Sufficient hot running water to facilitate cleaning.
- Cleaning chemicals and disinfectants must be registered by the SABS.
- A documented cleaning procedure for the milk storage equipment.
- Clearly marked cleaning equipment for the milk room.

Cleaning equipment must be placed on special wall brackets in order to increase their durability, and optimise their application and hygiene. The placement of the cleaning equipment should be carefully considered so that:

- It is clearly demarcated for use and available in the area where it is needed.
- The cleaning equipment are adapted to the type of work to be performed and to the persons using it.
- The use of wall brackets will assist in keeping cleaning tools dry and reduce possible bacterial growth. Wall brackets may further prolong the life of cleaning equipment due to less abuse during storage.

This will further assist in:

- Differentiating between cleaning equipment used on floors and inside of milk storage equipment.
- Reducing the risk of cross-contamination.

- Increasing the lifespan of the cleaning equipment and contribute to the reduction in cleaning costs.
- Assisting the personnel in having a responsible attitude towards hygiene measures.

All brooms and hand brushes used for cleaning in the milk room area must be made of material other than wood and should have nylon bristles, which should ideally be coloured to enable the detection of detached bristles, should be kept clean and in good condition and, when not in use, must be hung up with bristles facing downwards, to aid drying. Cleaning equipment must be marked by colour-coding or other means so that the equipment used for specific purposes can be easily identified, e.g. brushes used for cleaning the floors shall not be used on equipment surfaces (inside or outside of equipment).

When using cleaning cloths and scouring pads, care shall be taken to ensure that they are not a source of contamination, e.g. by being con-

taminated themselves or by being a source of foreign materials. Cleaning cloths of a woven fabric shall only be used if they are laundered and disinfected or sterilised according to a documented schedule. Alternatively, disposable or paper towels can be used. Cleaning chemicals and disinfectants, other than those used on a daily basis, may not be stored in the milk room.

REGULATION R961

7. (5) Milk containers, and other fixed and unfixed apparatus and equipment, shall be washed and disinfected after use so that they are clean, that fats and milk residues are dissolved and removed, and that the bacteriological count on surfaces coming into contact with milk does not exceed ten bacteria per 100 square millimetres of such surfaces after disinfection. The swabbing of the contact surfaces shall be conducted according to the SABS Standard Test Method 763: Efficacy of Cleaning Plant, Equipment and Utensils: Swab Technique.



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GOOD DAIRY FARMING PRACTICES

MILKING ROOM		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
Ensure that the milk room structure promotes hygiene.	<ul style="list-style-type: none"> • Ensure that structures are made from smooth-finished, non-absorbing and resistant-free material. • Ensure that structures are well-maintained and cleaned. • Implement effective pest control. • Ensure that the structures adhere to the requirements of regulation R961. 	Dairy farming practices meet all regulatory and industry requirements.
Effectively handle and store milk.	<ul style="list-style-type: none"> • Ensure that the milk storage area is clean and tidy. • Ensure that the milk is cooled to <math><5^{\circ}\text{C}</math> within the specified time after milking. • Ensure that milk storage equipment is adequate to hold milk at the specified temperature. • Ensure that milk storage equipment is cleaned and disinfected after each milk collection. • Ensure that general and personnel hygiene is adhered to. 	<p>Limit the potential negative impact of dairy farming practices on the handling and storage of milk.</p> <p>Dairy farming practices comply with relevant regulations.</p>



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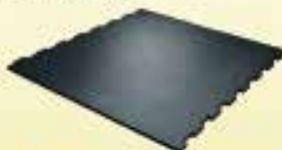
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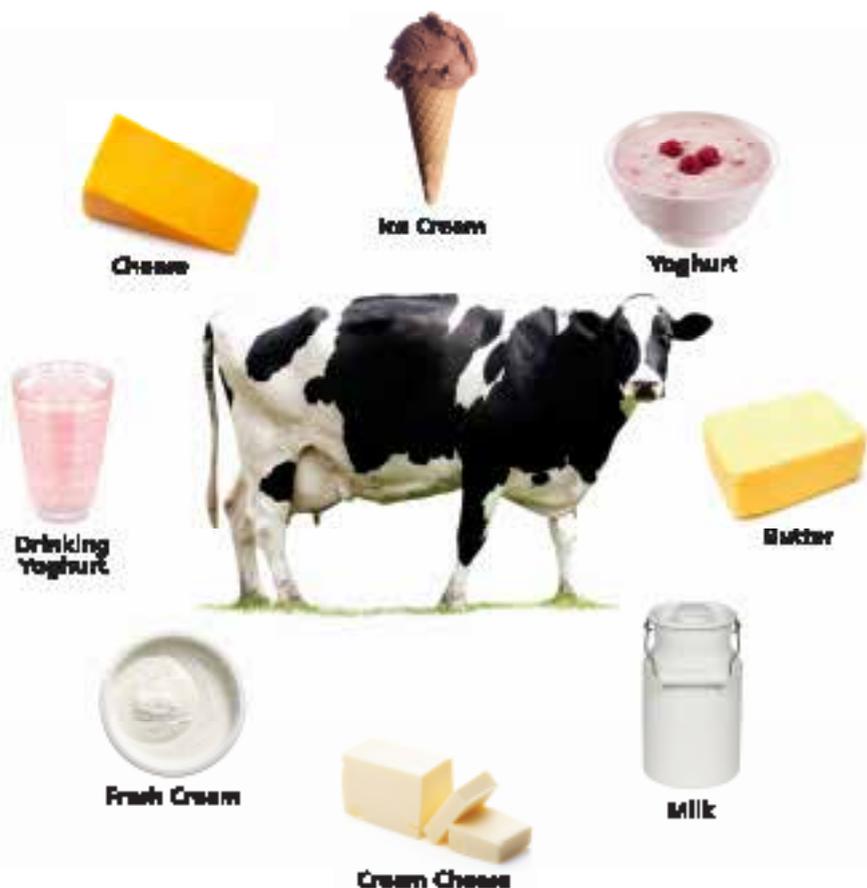
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4. GOOD MILKING PRACTICES

4.1 GOOD MILKING PRACTICES

Animals whose milk is unfit for human consumption need to be clearly identified and milked separately with the milk disposed of in such a manner as to ensure that the milk does not contaminate the bulk tank milk. Clean milking utensils, clean hands and short nails are an essential part of good milking practices.

ISO / TS 22002-3

7.4 The activity of milking shall be conducted in such a way that it minimises the likelihood of contaminating the milk. The organisation shall identify and implement measures that minimise the likelihood of contaminating the milk when milking.

NOTE: Examples of events that increase the likelihood of contaminating the milk are urination and defecation related to stress and animal discomfort during milking, which can easily cause these body wastes to enter the teat suction cups.

The colostrum and milk that do not appear normal shall be excluded from the food chain.

If the organisation discovers that milk intended for human consumption has been contaminated during milking, it shall take appropriate action to prevent such milk from entering the food chain.

The udders and teats must be clean and dry prior to milking. Disposable cloths should be used to ensure single usage and prevent cross-contamination between animals.

REGULATION R961

9 (7) All flanks, udders, bellies and tails of visibly dirty milk animals shall be cleaned before the milking process, and, if necessary, dried with a disposable or clean towel.

ISO / TS 22002-3

7.4 (b) Clean and, where necessary, disinfect all teats before milking, by appropriate means.

Implement effective control over and inspection of the milk of individual cows before milking starts, e.g. strip cup, California Mastitis Test (CMT) or an electronic system. The foremilk needs to be checked for any abnormality, e.g. clots or pus signifying mastitis. It is good practice to discard the first few drops of milk as these contain a large number of micro-organisms. Care needs to be taken that the foremilk shall be collected in a cup or utensil and not be thrown on the floor, where it will lead to contamination.

REGULATION R961

8 (1) The first/foremilk from every teat shall be taken as a sample to be tested for visual examination and shall be disposed of after testing in such a manner that it prevents contamination of the area. If such testing reveals any signs of abnormality in the milk, the milk of the animal concerned shall be kept separate and shall not be mixed with other milk or used for human consumption.

ISO / TS 22002-3

7.4 (a) Conduct, prior to milking a cow, an evaluation of the milk by visual examination or physicochemical indicators, after careful observation of the cow behaviour and the aspect of its udder and teats, to allow verification of whether the milk appears normal and is not likely to contaminate food.

Proper control must be exercised over any lubricants (e.g. teat dip or cream) used during the milking process.

REGULATION R961

9 (6) Substances and materials used in the milk-

ing process or on dairy stock shall be kept in containers that are free of foreign or toxic matter and dirt, and such containers shall be covered with tight-fitting lids when not in use. Where applicable, such substances and materials shall be approved in terms of the *Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947* (Act 36 of 1947).

4.2 MILKING PROCEDURES

Proper milking procedures, a positive attitude and a clean environment are required to minimise mastitis and maximise the production of quality milk from a herd. Management factors can add significantly to the benefit of good milking procedures. The order in which cows are milked can have an impact on controlling the spread of mastitis. By milking first lactation cows first, second and later lactation cows with low somatic cell counts second, cows with high somatic cell counts third and cows with clinical mastitis last, the chance of spreading mastitis organisms from cow to cow is reduced.

Good management dictates that the milker must be constantly alert to conditions that may spread mastitis organisms from cow to cow. Correcting such conditions assists in the production of high-quality milk from healthy udders. Milking must be done by people who are responsible and trained.

RECOMMENDATION FOR MILKING PROCEDURES

Provide a clean, low-stress environment for cows

A consistent operating milking routine is essential. Hormones released into the bloodstream during periods of stress may interfere with normal milk let-down, and frightened or excited cows may not have a normal milk let-down response in spite of an effective preparation routine. A milking environment that chronically stresses cows may predispose cows to a greater rate of mastitis.

Udder preparation



Drop hoses are convenient to spray teats.

Removing hair from udders reduces the amount of dirt and manure that may adhere to the udder and contaminate milk. Udders with long hair are difficult to clean and dry. A common method of preparation in milking parlours is to use a hose and hands to remove debris from teats. Only the teats shall be washed, as wetting the entire udder makes it difficult to adequately dry the udder before milking machines are attached.



Milking wet and/or dirty teats increases the risk of high bacterial counts in milk and also increases the probability of new intra-mammary

infection. Paper towels need to be used to dry the teats and the base of the udder. Use paper towels only once to prevent the spread of mastitis-causing organisms from cow to cow.

Pre-dipping works best when teats are relatively clean. The entire length of the teat must be immersed in the sanitiser. Pre-dip must remain in contact with the teat for 30 seconds and then be thoroughly wiped off prior to attaching the milking unit.



Personal hygiene

Before milking begins, hands must be thoroughly washed with soap and water and then dried. If hands become soiled during milking, they must be washed and dried again. All cuts or wounds must be treated and adequately covered. Clean, dry and healthy hands minimise the spread of mastitis-causing organisms from cow to cow.



Check the foremilk

Mastitis can be detected by using the hand to physically examine the udder and by using

a strip cup to examine foremilk prior to each milking. Correct usage of a strip cup can be a valuable aid in detecting mastitis symptoms, which include clotty, stringy or watery milk. This observation should be made on each quarter of every cow at each milking.

Because organisms may be spread by using dirty strip cups, strip cups must be cleaned and sanitised after each milking. The milk in the strip cup should not be disposed of on the floor of the milking parlour to prevent cross-contamination. Milk must never be stripped into the hand because this routine spreads organisms from cow to cow.

Attach the milking unit

The milking machine must be attached as soon as possible after milk let-down occurs. Attachment shall be done carefully to prevent excessive air from entering the milking system. Milk let-down causes maximum udder pressure approximately one minute after first stimulation and lasts about ten minutes. Most cows are milked out in five to ten minutes. Therefore, attaching machines within two minutes after first stimulation makes maximum use of the let-down effect.

There should be a consistent sequence of udder preparation and attachment of milking units so that units are attached within two minutes after the start of udder stimulation.

Adjust units for proper alignment

Observe units while they are attached to the udder to ensure correct adjustment and to help prevent liner slip. If teat cups are seated excessively high on teats, irritation to the lining of the teat may result. Improperly aligned units may block milk flow and increase the amount of milk remaining in the udder at the end of milking.

Of greatest concern is slipping or squawking teat cups. Only about one-third of slips produce audible squawks. Such occurrences

can result in an increase in infected quarters. The majority of new infections resulting from liner slips occur near the end of milking. Towards the end of milking, when a teat cup liner slips and the liner opens, small droplets of milk may be propelled back against the end of the teat. These droplets may contain mastitis-causing organisms which in some instances may enter the udder.

Since milk flow near the end of milking is minimal, chances of the organisms being flushed out of the quarter are reduced and an infection may result.

Shut off vacuum before removing the unit

The unit must be removed as soon as the last quarter milks out. In parlours equipped with automatic detachers care should be taken to ensure that they are properly adjusted. A minute or two of over-milking with a properly functioning milking machine is not a major cause of mastitis. However, the risk of liner slip and a possible new infection is the greatest during over-milking. The manner in which teat cups are removed is usually as important as when they are attached.

Vacuums should always be shut off before teat cups are removed. The practice of pulling the unit off under vacuum, must be avoided because it may result in liner slip and a new infection in one of the other quarters. The incorrect removal of units constitutes a very significant threat to udder health.

Hand-milking

The correct technique for hand milking is to restrain the animal to be milked using a method that does not cause pain or injury. Ensure that the milker's hands are clean and dry. Prepare the teats for milking, ensuring they are clean and dry. Handle the teats gently, ideally using the 'fist-grip' method, avoiding any discomfort,

pain or injury to the animal. Use buckets that are non-corrosive, easy to clean and disinfect, and do not taint the milk. Avoid contaminating the collected milk with foreign material such as dust, dirt, soil, urine, manure and flies.

The use of teat dip

Teat disinfectant may be applied after milking when necessary. Dip at least the lower one-third of each teat in a commercial teat antiseptic product after every milking. A good teat dip destroys organisms on teats, prevents teat canal colonisation of organisms and eliminates existing teat canal infections. A variety of teat dip products are available.

Maintain teat dip cups in a clean and sanitary manner, and never pour the remaining dip back into the original container. Teat spraying is an alternative to teat dipping. Results may be acceptable if done correctly with a suitable spray device that provides adequate coverage of each teat. A common problem frequently observed with spraying is that only a portion of the teat is sprayed.

4.3 TEAT AND UDDER HEALTH

Teat and udder health directly influences the quality of milk. Anything that compromises the health of the teat end potentially weakens the ability of the sphincter muscles to properly close the streak canal or the ability of the keratin lining to seal off the canal.

Chapped teats during winter, teats that are traumatised by being stepped on or from improper milking machine function, improper or repeated insertion of teat cannulas for intramammary infusion of antibiotics or other intramammary treatments for draining milk from teats that are damaged, inadequate vacuum level and pulsation rate and ratio or teat dipping all may compromise the health of the teat.

GOOD DAIRY FARMING PRACTICES

GOOD MILKING PRACTICES		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
Ensure milking routines do not injure the animals or introduce contaminants into milk.	<ul style="list-style-type: none"> • Identify individual animals that require special milking management. • Milk animals regularly using consistent milking techniques. • Ensure appropriate udder preparation for milking. • Ensure proper milking machine attachment and detachment. • Ensure adequate and hygienic hand milking. • Use only approved dips, sprays and lubricants. • Segregate milk harvested from sick or treated animals for appropriate disposal 	Dairy farming practices ensure good udder preparation and milking practices.
Effectively hygiene practices	<ul style="list-style-type: none"> • Ensure that the milking area is clean. • Ensure that the personnel adhere to hygiene practices, e.g. clean protective clothing and effective hand-washing techniques. • Ensure that the personnel do not have any communicable disease or cuts or wounds on their hands. 	Limit the potential of poor hygiene practices to prevent contamination of the milk.

5. ANIMAL HEALTH AND WELFARE

The *OIE Terrestrial Animal Health Code*, the *SPS Agreement* and the *Codex Alimentarius* are the three most essential reference documents to guide decision-making for the formulation and evaluation of sanitary measures for the control of animal diseases. The Code is not a textbook on animal diseases, but identifies and recommends standards and guidelines not only to facilitate trade in milking animals and their products, but also to help countries to protect their dairy industries against the introduction of trade-sensitive diseases of dairy animals.

There are 15 diseases listed in the Code that concern milk and milk products:

- Foot-and-mouth disease.
- Rinderpest.
- Lumpy skin disease.
- Enzootic bovine leucosis.
- Paratuberculosis (Johne's disease).
- Peste des petits ruminants.
- Sheep and goat pox.
- Caprine arthritis/encephalitis.
- Contagious agalactia.
- Rift Valley fever.
- Anthrax.
- Leptospirosis.
- Tuberculosis.
- Brucellosis.

In all 15 diseases, milk or milk products are implicated as a means of transmission of pathogens between animals or between animals and humans.

In addition, it has recently been determined that 62% of the 1 415 human infectious agents known to man can be transmitted between animals and humans and are therefore called zoonoses. Zoonoses transmitted through milk and dairy products can either

originate from the dairy cow directly or from the environment at any stage from production to consumption. Food-borne illnesses can be caused by infectious or toxic agents and usually account for the vast majority of all cases of intestinal disease reported.

Zoonoses of particular interest to the dairy industry include, but is not limited to, brucellosis, tuberculosis, leptospirosis, viruses, mycoses as well as bacteria and rickettsia causing mastitis, some of which are able to produce toxins with varying heat stability.

5.1 Herd health

Maintaining good animal health is essential to produce high quality and safe milk and is critical to ensure optimal production and profitability. Larger herds demand intensive management as the increase in numbers increases the risk of disease. Pro-active health management is essential, especially to detect disease as early as possible at a sub-clinical level.

It is essential to have a health herd management plan in place that specifies the preventive actions necessary to prevent new infection and deal with existing inadequacies in animal health. Such a programme will include national and regional requirements, and the needs of the milk buyer.

Measures must be taken to prevent disease from being introduced into a herd. These measures may include:

- Having a closed herd.
- Acquire animals with known health status, e.g. TB, brucellosis, mastitis.
- Place new animals under quarantine and perform the necessary tests.
- Prevent contact with neighbouring animals and prevent communal grazing.

- Implement a protocol for visitors and vehicles.
- Ensure water and feed quality.
- Implement a protocol for immunisation.
- Minimise the susceptibility of animals to disease by implementing good farming practices, e.g. good milking practices and good hygiene practices.
- Implement a good recordkeeping system as part of the herd or animal health management.

Furthermore, food safety requirements and the requirements of customers with regards to food safety issues, e.g. *E. coli* O157, *Listeria monocytogenes*, *Campylobacter* spp. and *Salmonella* spp. outbreaks as well as rBST, need to be taken into consideration.

Animal identification is essential in ensuring that health and treatment records can be kept. Animal health management helps to prevent health problems from entering or spreading within the herd.

Regulation R961

Health status of dairy stock

9. (1) Every milk animal shall be marked with a distinguishing and indelible mark which could identify the animal.

(2) A register shall be kept of each separate milk animal's diseases, each withdrawal from the dairy herd and each return to the dairy herd for milking purposes, and all veterinary examinations and treatment records with the name of the veterinarian, if involved in such examinations or treatments.

(3) Each individual milk animal shall be examined by a veterinarian at a minimum of at least once in every two-year cycle, provided that milk animals shall be further examined as required, and a report shall be obtained from the veterinarian after each examination.

(4) The milk of any milk animal that is or appears to be ill shall not be made available for human consumption until such time as the holder has made sure that the animal is not suffering from a disease mentioned in sub-regulation (5).

(5) The milk of dairy stock that suffer from mastitis, indurations of the udder, a secretion of bloody or ropy milk or milk otherwise abnormal, tuberculosis, salmonellosis, acute fever with the inclusion of anthrax, anaplasmosis, redwater, ephemeral fever and lumpy skin disease, septic metritis, septic multiple mange, serious tick infection or brucellosis, or that have any open or septic wounds which may contaminate milk, milk containers, or apparatus or equipment or people who work with the milk animals, shall not be made available or used for human consumption unless steps have been taken to the satisfaction of the local authority to eliminate such health hazard.

ISO /TS 22002-3

5.6 Working animals

Working animals used for farming activities shall not increase the likelihood of contaminating foods.

The organisation shall identify and implement measures to minimise the likelihood of transferring contaminants from working animals to foods, directly or indirectly through food-producing animals.

Depending on the operations and where appropriate to minimise the likelihood of food contamination, examples of PRPs that shall be implemented are to:

- a) Keep working animals in good health by appropriate check-ups, treatment or vaccination by or upon recommendation of a veterinarian or similarly recognised competent person in animal health.

5.1.1 Disease treatment

Many cattle that become sick with common diseases on dairy farms are treated routinely by the producer or farm personnel rather than a veterinarian. Examples of diseases that are often routinely treated by producers include diarrhoea, milk fever and mastitis. Because any treatment increases the risk of residues in milk, treatments should be given according to pre-arranged protocols. These should be developed by the veterinarian in consultation with the producer. They should be readily available and written so that they are easily understood by the people who will be implementing them.

Cows whose milk is unfit for human consumption (e.g. those having been treated with antibiotics) shall be clearly identified.

Animals under treatment will usually produce milk unsuitable for consumption by man or any other animal on the farm. Both infected animals and the milk from infected animals, and those under treatment, may need to be separated to minimise the transmission of infection and danger of contaminating the wholesome milk being produced on the farm.

To ensure full compliance with these obligations, the treatments applied shall be recorded for each animal. These should be written records to allow proper traceability, to ensure safe and suitable milk and to allow all involved in managing the animals to act properly.

Treatment records should include: Identification of the animal, date of treatment, medicine used, dosage, withdrawal period, date of end of withdrawal period and person responsible for treatment.

Treatment protocols can be in several formats, e.g. cow cards, electronic and/or diary format. Treatment protocols for diseases or conditions should contain:

- Information on how to recognise affected cattle.
- Information on separate action steps that are related to the severity of the illness.
- Detailed treatment and management recommendations.
- Actions to be taken if the animal's health does not substantially improve or becomes worse.

5.1.1.1 Immunisation

A vaccination protocol should outline the recommended vaccination procedures for each management group on the herd. It shall include information on the vaccine to be used and dosage, the group to be vaccinated and recommendations on when they shall be vaccinated.

Immunisation differs from region to region.
Your local veterinarian will be able to provide you with the necessary information.
PREVENTION IS BETTER THAN CURE.

5.1.1.2 Chemical and veterinary medicines

It is important to use only products that are intended and approved for milk-producing animals. Product labels give directions on use, suitability, treatment schedules (dose rates and frequencies) and effects on the animals and milk supply.

Veterinary medicines are usually closely controlled, often available only by prescription and usually with individual instructions for use from the prescribing veterinarian. The instructions provide for the safe and effective use of these active products, and are the results of scientific study and clear evidence to ensure effectiveness and safety. These instructions should be carefully followed and are extremely important to ensure a complete milk withholding period for the animals that are being treated.

Products and veterinary medicines are expensive and need to be stored appropriately, as instructed, because their durability and effectiveness may be substantially compromised if handled improperly. Medicine may also be potentially dangerous when handled by un-informed personnel and therefore shall to be stored securely, e.g. locked away. Proper signage should indicate the presence of medicine.

A medicine or vaccine register should be kept and should include the name of medicine, batch number, date purchased, where it was purchased, volume, active ingredient, expiry date, intended use and storage location.

Regulation R961

Health status of dairy stock

9 (6) Substances and materials used in the milking process or on dairy stock shall be kept in containers that are free of foreign or toxic matter and dirt, and such containers when not in use shall be covered with tight-fitting lids. Where applicable, such substances and materials shall be approved in terms of the *Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947* (Act 36 of 1947).

5.1.1.3 Antibiotics

Antimicrobial agents play a significant role in animal health and welfare management. Strict protocol and adequate identification shall prevent the antimicrobial agents from entering the milk. However, the emergence of multi-resistant bacteria poses a challenge to the dairy industry, especially to the primary producer. These bacteria are resistant to antibiotics and pose a risk to human health, especially to children, the elderly and immune-compromised individuals. Improper and misuse of antibiotics will lead to an increase in multi-resistant bacteria.

Ultimately the dairy farmer is responsible for the health and welfare of his herd and can by implementing good farming practices, includ-

ing an effective herd health management programme, greatly reduce the need for the use of antimicrobial agents.

R1555

Restrictions

2. No person shall use or sell raw milk intended for further processing which:

(a) Contains the following:

(i) Antibiotics or other antimicrobial substances in amounts that exceed the maximum residue levels stipulated in the Regulations governing Maximum Limits for Veterinary Medicine and Stock Remedy Residues that may be present in Foodstuffs (Government Notice No. R1809 of 3 July 1992, as amended, hereafter referred to as the Maximum Limits for Veterinary Medicines and Stock Remedy Residues Regulations), or which virtue of a presumptive test is suspected to contain antibiotics or other antimicrobial substances in amounts that exceed such maximum residue levels.

5.1.1.4 Disposal of hazardous waste

Hazardous waste includes medicine containers and needles. This waste should be disposed of in such a manner that no humans or animals will be harmed or that the environment will not be contaminated. Needles need to be stored in a dedicated and clearly marked container which needs to be disposed of at a veterinary office or clinic.



5.1.2 Tuberculosis (TB)

TB is a chronic, contagious disease which can spread from human to cattle and vice versa. TB

can spread through air, manure, saliva, blood and milk. Children under the age of six years are very susceptible to TB and infection can lead to the death of the child. This is why it is of utmost importance to ensure that your herd is TB-free. It is furthermore a legal requirement in terms of R961 that dairy farmers must put measures into place to ensure that dairy animals of which the milk is destined for human consumption, are free from contagious diseases such as TB. A TB-test can only be conducted by a registered veterinarian.

Obtaining a declaration

The first declaration issued by the state veterinarian indicating that all animals tested are free from bovine tuberculosis, is issued after two negative intradermal tests within a three-month interval. This may differ between provinces.

Maintaining the declaration

The declaration is valid for a period of two years from the date of the last test. This declaration is maintained with a single intra-dermal test performed by a private veterinarian with a two-year interval. The cost of the maintenance test is for the producer's account.

5.1.3 Brucellosis (CA)

Brucellosis is a chronic but not deadly disease. Humans can be infected by the *Brucella* bacterium if they drink contaminated milk, which may cause a disease called rock fever also known as brucellosis. Symptoms in humans include aching joints, fever and headaches. As with TB, all farmers supplying milk for human consumption must have a brucellosis-free herd. Brucellosis can be tested with a blood test, but this blood must be drawn by a registered veterinarian.

Obtaining the declaration

The first declaration is issued by the state veterinarian after two negative serological tests with a 2-3 months interval, on condition that all the female cattle over 18 months of age of all the

owners on the farm, are tested negative from the start. If there are any positive reactions at any stage, further serological tests will be done and possible other samples will be collected (milk, lymph nodes, cotyledons) to establish the status of the herd.

The herd must test negative as follows before a declaration can be issued:

- First negative test – re-test after 60 days.
- Second negative test – re-test after 60 days.
- Third negative test – re-test after six months while monthly milk ring tests are performed. If any MRT-positive result is obtained, re-testing must be performed immediately.
- Forth negative test – if heifers from infected cows are slaughtered, the declaration can be issued. If not, a negative test after a year is required before the declaration can be issued while monthly milk ring tests are performed. If any MRT-positive result is obtained, re-testing should be performed immediately.

Maintaining the declaration

The declaration is valid for a period of two years from the date on which the last test was performed. Should brucellosis occur in the herd, the producer must adhere to the following:

- Annual serology test performed by a private veterinarian. Declaration issued after a negative serological test result is obtained.

OR

- Monthly bulk milk sample for the brucellosis milk ring test (MRT). A declaration is issued after twelve negative milk ring test results, not more than 30 days apart. A declaration will only be issued on MRT results if it has been done according to prescriptions and provided that there is no gap between the previous declaration and the start of negative milk ring tests.

It is recommended that a monthly bulk tank milk sample for a milk ring test should be implemented in areas where high incidences of brucellosis occur. If the declaration has been is-

sued previously and has lapsed, one negative serological test shall be done on condition that all the female cattle over 18 months of age of all the owners on the farm tested negative.

NB: It is the responsibility of the milk producer to ensure that a monthly milk ring test is done or to ensure that his milk buyer does it on his behalf. This is very important for maintaining and re-issuing of the declaration. Milk ring test results must also be forwarded to the relevant state veterinarian's office on a monthly base.

5.1.4 Issuing of brucellosis and tuberculosis declarations

The provincial state veterinarian will issue the declarations after he received the results from the private veterinarian. It is the responsibility of the private veterinarian who performed the tests to forward the results to the relevant state veterinarian's office.

It is of utmost importance that milk buyers and processors ensure that milk is obtained from a milk producer that can provide TB and CA declarations. These declarations are requirements in terms of the:

- Notifiable and controlled animal diseases in the *Animal Diseases Act (Act 35 of 1984)*.
- Regulations of the *Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972)*.

5.1.4.1 What happens when a herd tests positive for brucellosis?

All positive herds are under the control of the government – provincial directorate of veterinary services, state veterinarian of that area. All tests are done at government expense, provided tests are done by their staff. If an owner prefers to use a private veterinarian, it will be at the owner's expense. When a milk producer has a positive MRT, an animal health technician of the area will bleed the herd as soon as possible.

Positive herds are handled as follows:

All positive herds are under the control of the

state veterinarian of that area. The state veterinarian will manage the brucellosis according to protocol, which will include the following:

- Vaccination protocol.
- Bleeding of the herd on a two-monthly basis for serology tests up to first negative serology test.
- Identification of positive animals according to guidelines and protocol.

Before a positive herd can be declared negative, the following negative tests shall be obtained:

- First negative test – re-test after 60 days.
- Second negative test – re-test after 60 days.
- Third negative test – re-test after six months with monthly MRTs performed to monitor the situation.
- Fourth negative test – a declaration can be issued if heifers from infected cows are slaughtered out. If not:
- Fifth negative test – after 12 months. A declaration can then be issued.

5.1.4.2 What happens when a herd tests positive for tuberculosis?

As in the case of a positive herd for brucellosis, a positive tuberculosis herd is also the responsibility of the state veterinarian of the area to handle it according to protocol.

Positive herds are handled as follows:

After the herd has been identified as TB-positive, a declaration shall be issued if two negative test results are obtained within a three-month interval.

What must the milk buyer do in the case of a TB- or CA-positive dairy herd

Milk from a positive brucellosis herd can still be purchased and processed. It is, however, important that the milk should be effectively pasteurised. It is also important that cooperation is given by a dairy producer to the state veterinarian for the effective handling of the herd.

5.1.5 Mastitis

Mastitis is the most costly and common disease on a dairy farm and is a production, quality and food safety issue. Undetected at a subclinical level, it may not be effectively prevented or controlled. Mastitis causes significant losses through reduced milk production and lower milk quality. Profit loss is real and could mean the difference between the success and failure of a dairy operation, e.g. an udder quarter chronically infected with subclinical mastitis and with an SCC of 300 000 cells/ml will lead to a 6% average loss of potential milk production.

Mastitis is an inflammation of the milk-producing tissue of the udder. It is caused by:

- Primarily bacterial infection, e.g. *Staphylococcus aureus* and *Streptococcus agalactiae*.
- Mechanical trauma.
- Thermal trauma.
- Improper use of chemicals.
- Injury.

It presents either as subclinical or clinical mastitis. Subclinical mastitis is not noticeable to the naked eye, while clinical mastitis is recognised when flakes or clots are seen in a milk sample and swollen, painful and/or hot-to-touch udders with an abnormal milk secretion, e.g. the milk appears thin, discoloured or watery, are observed. The cow may have a rapid pulse and loss of appetite. Any increase in SCCs, which is a normal constituent of cows' milk at a rate of about 100 000 cells/ml in bulk herd milk, is caused by compromised udder health.

Mastitis is recognised as the most costly disease in dairy cattle and prevalence in dairy cattle approach or exceeds 25% of quarters at any time. Costs of mastitis include:

- Decreased milk production is associated with subclinical or clinical mastitis. This accounts for about 70% of the total cost of mastitis. About 10-26% of total milk loss occurs in quarters with subclinical mastitis.

- Milk dumped for antibiotics is the major cost associated with clinical mastitis. Discarded milk and decreased production accounts for about 85% of the cost of clinical mastitis.
- Veterinary costs.
- Labour costs.
- Culling and death costs.
- Lost milk quality premiums due to increased SCC, decreased milk fat and decreased protein, which may occur as a result of mastitis.

Effective control and prevention

Attempts to solve udder health problems with antibiotics is not the solution, because antibiotics have no effect on somatic cells. Antibiotic treatment can at best only be used against bacteria and is often found not to be successful.

A number of key management issues need to be addressed to maintain udder health. These include:

- Pest control, e.g. fly control.
- Correct nutrition.
- Personal hygiene.
- General hygiene.
- Personnel training.
- Good milking practices.
- Maintenance of the milking equipment.
- The identification of problem animals.

Flies play a significant role in poor udder health. They are efficient vectors of disease and can transmit mastitis-causing bacteria such as *Staphylococcus aureus*, *E. coli* and *Streptococcus*



uberis. They also cause irritation and the continued stress results in reduced milk production and an increase in the SCC. Biting flies can cause an irritable reaction and stress with accompanying udder health problems.

Fly problems are preventable and fly management should be part of any udder health programme. Best management practices include cleanliness, good drainage and the continuous removal of manure and organic matter from around the parlour and calf-rearing areas to eliminate potential fly-breeding areas. Wasps, bait and knock-down sprays will also help to control fly populations.

Strategic prevention programmes

For the development of strategic prevention programmes for particular herd mastitis, infections are classified as arising from either cow or environmental sources. Mastitis caused by infections whose sources are the cows themselves, is called contagious mastitis. Contagious mastitis spreads from infected cows' udders and teat skin to uninfected cows at milking time. Environmental mastitis occurs when bacteria from manure contaminating the cow's environment, enters the teat ends. Cows are at risk of environmental infections at all times during the day and year.

Udder health, e.g. mastitis, directly influences the quantity and quality of milk produced.



Mastitis prevention programmes are developed for a herd using knowledge of the mastitis infections that the herd is most at risk of, the milk quality objectives, facility design, current management practices, concurrent diseases, environmental conditions and labour availability. The prevention of new infections and elimination of existing infections are the main objectives of a mastitis prevention programme. Goals should be developed by a producer in conjunction with his/her herd veterinarian to develop an approach for improvement in animal health and milk quality.

Overall goals to strive for may include:

- The maintenance of SCC below 200 000 cells per millilitre for a bulk tank milk.
- A reduction in the occurrence of clinical mastitis to two or fewer clinical cases per 100 cows per month (<24% of cows affected per year).
- The eradication of a specific mastitis-causing bacteria from the herd.
- Maintenance of a low culling rate due to mastitis.

From an animal welfare perspective, mastitis infection can be a local painful infection for the cow that can, depending on the type of infection and the resistance of the cow, also cause systemic illness resulting in fever, dehydration, depression and even death.

5.1.6 Recommended practices

Consult with the herd veterinarian to develop a mastitis diagnostic, monitoring and control programme.

To prevent contagious mastitis infections:

- Dip each teat of all cows after every milking with an approved teat dip.
- Ensure dip covers the area of the teat skin that had contact with the teat cup liner.
- Ensure infected cows are milked last or separately from uninfected cows.
- Implement a monitoring system using

individual cow somatic cell counting and strategic milk culturing as recommended.

Mastitis infections can be prevented by reducing exposure of the teat ends to bacteria. Appropriate practices should be implemented, depending on the source of the bacteria identified in a herd culture programme.

To prevent environmental mastitis infections:

- Clean and dry teats before milking.
- Keep alleyways, crossovers and walkways free of manure and mud.
- Design holding camps to give cows twelve hours of rest time, if used.
- Have all cows calve in a clean, dry maternity pen.
- Protect the teat channels of dry cows during the dry period.
- Feed a ration that prevents stress on the immune system of fresh cows.
- Record clinical cases of mastitis and treatment as they occur.
- Assess clinical records of mastitis cases to

detect herd-specific risk factors for environmental mastitis.

To eliminate existing contagious and environmental infections (reducing prevalence):

- Treat cows at the end of lactation with an approved intra-mammary dry cow preparation, as recommended by your herd veterinarian.
- Treat cows shown to have antibiotic susceptible infections during lactation, as recommended by your herd veterinarian.
- As a last resort, cull cows with incurable cases of mastitis.

R1555

Restrictions

2. No person shall use or sell raw milk intended for further processing which:

(a) Contains the following:

(ii) Pathogenic organisms, extraneous matter or any inflammatory product or other substances which for any reason whatsoever may render the milk unfit for human consumption.

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GOOD DAIRY FARMING PRACTICES

ANIMAL HEALTH		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
Prevent the entry of diseases onto the farm.	<ul style="list-style-type: none"> • Have secure boundaries/fencing. • Avoid direct contact of visitors with animals and take safety measures in precaution of spreading of diseases. • Have bio-security measures in place to minimise the risk of spread of diseases within the farm. • Utilise disinfectant as a means of undertaking cleaning and disinfecting of boots/ clothing, vehicles and facilities. • Source animals of known disease status and control their introduction onto the farm. • Compile a policy for introducing animals of unknown disease status. 	Dairy farming practices ensure the prevention of introducing disease into a herd.
Implement an effective herd health/disease health management programme.	<ul style="list-style-type: none"> • Use a recognised system that allows all animals to be identified individually from birth to death. • Develop an effective herd health management programme focused on prevention. • Regularly check animals for signs of disease. • Attend to sick animals with contagious diseases quickly and in an appropriate way. • Isolate sick animals. • Keep written records of all treatments and identify treated animals appropriately. • Manage animal diseases that can affect public health (zoonoses). 	Dairy farming practices ensure effective animal health through the implementation of a herd health management programme.
Use all chemicals and veterinary medicines as prescribed.	<ul style="list-style-type: none"> • Use chemicals according to directions, calculate dosages carefully and observe withholding periods. • Only use veterinary medicines as prescribed by veterinarians and observe withholding periods. • Store chemicals and medicines securely, respect expiry date, dispose of correctly. 	Dairy farming practices ensure the prevention of residue in milk.

5.2 ANIMAL FEED AND WATER

The safety of food of animal origin begins with safe animal feed. Feed manufacturers, farmers and food operators have the primary responsibility for food safety. Potential hazards associated with animal feed include mycotoxins (aflatoxins), infectious agents such as *Salmonella*, *E. coli* and transmissible spongiform encephalopathies (TSEs), residues of veterinary drugs, antimicrobials, melamine, environmental and industrial contaminants. The feed chain includes the sourcing, processing and storage of feed raw materials, all posing some degree of risk towards contamination or quality deterioration.

Potential hazards

Animals should be given feed and water in sufficient quantities, and with products of suitable quality and safety. The nutritional needs of the animals shall be met, while good quality water supplies shall be provided. The water source should be regularly checked and maintained. Regularly inspect and, when necessary, clean and disinfect feeding and watering facilities such as drinkers and troughs. Ensure that effluents are managed in such a way that drinking water sources are not contaminated.

Different equipment shall be used for the handling of chemicals and feedstuffs. All pesticides used on pastures and forage crops shall be approved and recorded. Appropriate withdrawal times shall be implemented for grazing. If medicated feed is used, ensure that approved chemicals were used. Ensure that melamine is specified on the certificate of analysis. Obtain a melamine declaration from the feed supplier.

Owners or managers of livestock should ensure that antibiotics are not used in feed for growth promoting purposes in the absence of any public health safety assessment and recommendations and that ruminant protein is not fed to ruminants. Separate feeds are intended for different species.

Ensure traceability of feedstuffs bought by maintaining records of all feed or feed ingredients received on the farm, e.g. specified bills or delivery notes. All suppliers of animal feeds should have an approved quality assurance programme in place. Manage the feed chain (transport, storage and feeding) in such a way that it protects feed from contamination (biological, chemical and physical hazards) and minimises deterioration. Feeds should be used as soon as possible and, if applicable, in accordance with label instructions.

Keep records of all feeds and dates of acquisition and feeding, and where possible the animals/ groups of animals fed should be clearly recorded. Self-mixed feeds should have their ingredients and mixes recorded, as well as dates of feeding and animals fed as specified above.

Feed storage areas must be constructed to protect as far as practical against entrance and harbouring of domestic animals, wildlife and vermin. Efforts should be made to protect feedstuffs from soiling and contamination. In particular, evidence of faecal contamination or stale feed at the point of presentation to dairy cattle is not acceptable. An appropriate vermin control programme with suitable records shall be provided for stored feed. Mouldy feed shall be rejected.

Where appropriate, manage pastures by stocking rate and rotation to maintain healthy and productive livestock and reduce parasite burdens. Keep records of pasture rotation and other on-farm animal movements between e.g. pens and sheds.

Regulation R961

6. (6) A holder shall see to:

(a) In or at a milking shed:

(iv) Appropriate storage conditions to avoid feed contamination.

GOOD DAIRY FARMING PRACTICES

ANIMAL FEED AND WATER		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
Feed and water for all animals to be of suitable quality and safety.	<ul style="list-style-type: none"> • Ensure that the nutritional needs of the animals are met. • Ensure that good quality water supplies are provided, regularly checked and maintained. • Use different equipment for handling chemicals and feedstuffs. • Ensure chemicals are used appropriately on pastures and forage crops. • Only use approved chemicals for treatment of animal feeds or components of animal feeds and observe withholding periods for grazing. • Separate feeds intended for different species. • Water provided to animals shall comply with SANS 241. • Water storage vessels shall be inspected regularly and shall prevent possible contamination. 	Dairy farming practices ensure adequate and safe feed and water to all animals.
Control feed storage conditions.	<ul style="list-style-type: none"> • Feed storage areas must be constructed to protect as far as practical against entrance and harbouring of domestic animals and vermin. • Efforts must be made to protect feedstuffs from soiling and contamination, e.g. faecal contamination or stale feed. • An appropriate vermin prevention and control programme shall be provided for stored feed. • Mouldy feed should be rejected due to the danger of aflatoxins. 	Dairy farming practices ensure controlled storage conditions for feed to prevent the introduction of contaminants.
Ensure traceability of feedstuffs.	<ul style="list-style-type: none"> • All suppliers of animal feeds should have an approved quality assurance programme in place. • Maintain records of all feed or feed ingredients received on the farm (specified bills or delivery notes). • Address melamine with the feed supplier. 	Dairy farming practices ensure full traceability of animal feed.

5.3 ANIMAL WELFARE

The welfare of an animal is determined by its capacity to avoid suffering and sustain fitness. Fitness describes physical welfare, e.g. freedom from disease, injury and incapacity, and this is particularly important when these problems can be directly attributed to the conditions in which the animals are reared, including lameness attributable to unsatisfactory housing.

In South Africa the *Animal Protection Act, No 71 of 1962*, lists the offences.

The Farm Animal Unit of the NSPCA operates nationally under this Act and provides a dual role with proactive and reactive work, with their main aim to uplift the welfare of animals.

In the wild or in very extensive farming systems, animals regulate their own welfare according to their own perceived needs. The opportunity for an animal to control its own welfare is a basic behavioural need, and denial of this right, e.g. in a stall, is a potential source of suffering. In most intensive farming systems, including dairy production, most of the physiological and behavioural needs of the animals are provided by the system so that the quality of welfare is determined by the quality of the farming practices. This includes the provision of appropriate resources, skilled and trained personnel, and clear records of strategic planning, actions and consequences.

In essence, animal welfare is the application of sensible and sensitive animal husbandry practices to the livestock on the farm. Animal welfare is primarily concerned with the wellbeing of the animal. In general, consumers perceive high animal welfare standards as an indicator that food is safe, healthy and of high quality. Many animal welfare codes list “five freedoms” that should underpin best farm practice in relation to animal welfare.

These five freedoms provide a comprehensive overall concept of animal welfare:

Ensure that animals are free from thirst, hunger and malnutrition.

Dairy livestock should be given sufficient feed. Their requirements will vary according to their age, bodyweight, stage of lactation, production level, growth, pregnancy, activity and environment. Dietary supplements need to be considered if the ration is unable to meet the animal's nutrient requirements. Animals should be fed a balanced diet and have unrestricted access to clean water. Provide enough space around feeding and watering points to ensure all livestock have sufficient access. Protect animals from access to toxic plants and contaminated areas such as farm dumps. Do not feed animals mouldy feeds. Store chemicals securely to avoid contamination of pastures, and observe withdrawal periods for pasture and forage treatments.

Ensure that animals are free from discomfort.

Consideration should be given to the free flow of animals when designing and building animal housing and/or milking sheds. Avoid dead ends, and steep and slippery pathways. Floors should be constructed to minimise slipping and bruising due to slippery or uneven floors. Excessively rough concrete or surfaces with sharp protrusions and stones can cause excessive wear or penetration of the sole of the hoof, resulting in lameness. Ensure dairy buildings are safely wired and properly earthed. Avoid overcrowding of animals, even for short periods. Keep animal group sizes manageable and provide adequate feeding and watering space to reduce aggressive competitive behaviour. Most dairy species have strong herding instincts. Group animals together by similar weight and size if possible.

Provide housed animals with adequate space for resting on comfortable bedding and pro-

tected from hard surfaces such as concrete. These areas should be kept clean. Grazing areas are usually suitable for resting, provided that they are rotated frequently and have adequate drainage. As far as practicable, protect animals from adverse weather conditions and the consequences thereof. Have plans to protect dairy animals against emergencies (e.g. back-up power supplies) and natural disasters (e.g. fire, drought, extreme cold or flooding). Include the provision of high ground in the case of a flood, provide adequate fire-breaks and have evacuation provisions. All animal housing should be adequately ventilated, allowing sufficient supply of fresh air to remove humidity, allow heat dissipation and prevent build-up of gases such as carbon dioxide, ammonia or slurry gases.

The loading and unloading facilities shall be adequate and water should be available if appropriate. A suitably constructed vehicle to safely contain the animals has good footing and adequate space allowances shall be used. Thoroughly plan longer journeys to ensure that statutory welfare (feed, watering and resting) requirements are met.

Ensure that animals are free from pain, injury and disease.

Animals should be regularly checked to detect injury and/or disease. Treatment and preventative herd health management programmes should be in place. People carrying out veterinary related tasks should be able to demonstrate competency, especially for procedures that could cause suffering, e.g. budding/dehorning. Adhere to national regulations with respect to these and other practices (such as hot branding, tail docking, teat amputations, etc.). Good hygiene is essential for surgical-type procedures. Consider alternative animal husbandry practices if appropriate.

Develop an appropriate birthing plan that considers issues such as choice of sire (for ease of birthing), safe birthing facilities and regu-

lar checking of animals to ensure that prompt, experienced help is provided if required. Newborn animals should be fed colostrum soon after birth. Wean young dairy animals once they are consuming sufficient dry feed. Calves should not be offered for sale until they are sufficiently hardy to be transported. Adequate body weight and dry navel are good indicators. Appropriate transport conditions stipulated in national welfare regulations or codes of practice should be followed.

Laneways, yards, milking stalls and housing should be constructed to minimise the incidence of lameness. Regular hoof care management practices should be implemented and the animals' diets adjusted to minimise lameness. Lameness should be investigated to determine underlying causes and treated appropriately. Allow animals to move at their own pace.

Establish a regular milking routine appropriate to the stage of lactation that does not overly stress the animals. Poor milking practices can affect animal wellbeing and production. Milking equipment should be well-maintained and regularly serviced. When it is necessary to kill sick or diseased animals, or those in pain, it should be done promptly and in a manner that will prevent unnecessary pain.

Ensure that animals are free from fear.

Good design of facilities to take advantage of the natural behaviour of dairy animals can enhance the movement of animals, reducing the number of negative interactions required by the stock handlers. Quiet, consistent handling practices using well-designed facilities promote better productivity and safety from reduced fear and stress.

Good stock handling and husbandry skills are key factors in animal welfare. Without competent, diligent care of animals their welfare will be compromised. A competent operator should be able to:

- Recognise whether or not the animals are in good health.
- Understand the significance of a change in the behaviour of the animals.

- Know when veterinary treatment is required.
- Implement a planned herd health management programme, such as preventive treatments or vaccination programmes when necessary.
- Implement appropriate animal feeding and grassland management programmes.
- Recognise if the general environment (indoors or outdoors) is adequate to promote good health and welfare.
- Have management skills appropriate to the scale and technical requirements of the production system.
- Handle animals compassionately and in an appropriate manner.
- Anticipate potential problems and take the necessary preventive action.

Staff should be familiar with and comply with all relevant national regulations, and should maintain records to demonstrate compliance with regulations or assurance schemes. People already involved in animal management/husbandry must keep themselves abreast of

technological developments that can prevent or correct welfare problems. The facilities and equipment used to handle the animals must be appropriate for the purpose, well designed and maintained. This can avoid injury to both people and the animals. Careful use of equipment can reduce fear in animals, and make them easier and safer to handle. Monitor the animals' behaviour to identify aspects of the facilities or equipment that may provoke fear or be causing discomfort.

Ensure that animals can engage in relatively normal patterns of animal behaviour.

Most dairy species are gregarious animals. Use herd management and husbandry procedures that do not unnecessarily compromise their natural behaviours, e.g. herding, feeding, reproductive and resting behaviours. This also means sufficient space should be provided for these activities. During the daily inspection(s) of animals, check for any abnormal behaviour. Each animal shall have adequate space to feed appropriately and must actually be feeding. Failure by an animal to feed may be an early indication of illness.

**Lusern en Veevoere . . .
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GOOD DAIRY FARMING PRACTICES

ANIMAL FEED AND WATER		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
Ensure that all animals are free from hunger, thirst and malnutrition.	<ul style="list-style-type: none"> • Provide sufficient feed (forage and/or fodder) and water every day. • Provide sufficient space at the feeder and water to avoid competition among animals. • Protect animals from toxic plants and other harmful substances. • Provide adequate water supplies of good quality that are regularly checked and maintained. 	Dairy farming practices ensure healthy and productive animals.
Ensure that all animals are free from discomfort.	<ul style="list-style-type: none"> • Design and construct buildings to be free of obstructions and hazards. • Provide adequate space allowances and dry bedding. • Protect the animals from adverse weather conditions and the consequences thereof. • Provide housed animals with adequate ventilation. • Ensure that the floors are not slippery. • Protect animals from injury and distress during loading and unloading and provide appropriate conditions for transport. 	Dairy farming practices ensure protection of animals against extreme climate conditions and provide a safe environment.
Ensure that all animals are free from pain, injury and disease.	<ul style="list-style-type: none"> • Have an effective herd health management programme in place and inspect animals regularly. • Protect the animals against lameness. • Do not use procedures and practices that cause unnecessary pain. • Follow appropriate calving and weaning practices. • Have appropriate procedures for marketing calves and young dairy animals. • Protect against lameness. • Milk lactating animals regularly. • Avoid poor milking practices as they may injure dairy animals. • When animals have to be euthanised on-farm, avoid unnecessary stress or pain. 	Dairy farming practices ensure humane action, good hygiene conditions, the prevention of pain, injury and disease, the prompt treatment of pain, injury and disease, humane destruction of badly injured or incurably diseased animals.

Ensure animals are free from fear.

- Consider animal behaviour when developing farm infrastructure and herd management routines.
- Provide competent stock handling and husbandry skills and appropriate training.
- Use facilities and equipment that are suitable for animal handling.

Dairy farming practices ensure that animals are less fearful of people, their handling facilities and their Environment, and ensure the safety of animals and people.

Ensure animals can engage in relatively normal patterns of animal behaviour.

- Have herd management and husbandry procedures that do not unnecessarily compromise social activity.
- Adequate space to move around, eat and sleep.

Dairy farming ensures freedom of movement and preserves gregarious behaviour and other behaviours, such as preferred sleeping position.



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6. HYGIENE

Milking should be carried out in such a manner that it minimises contamination of the milk being produced.

Effective hygienic practice during milking is an important element in the system of controls necessary to produce safe and suitable milk and milk products.

Failure to implement and maintain effective hygiene and employee hygiene practices, has been shown to contribute to the contamination of milk with undesirable micro-organisms, pathogens as well as chemical or physical hazards.

Cleaning procedures should effectively remove milk and other residues that may contain micro-organisms or promote microbiological growth on milk contact surfaces. A surface may be chemically, physically or microbiologically clean.

- **Chemically clean:** When chemicals which can have an adverse effect on food safety have been removed by cleaning operations. This may include the breakdown/removal of chemicals used for cleaning and/or disinfection.
- **Physically clean:** When all visible "soil" or residues are effectively removed from surfaces. Physical cleanliness is usually judged visually and it is important to note that milk contact surfaces may be physically clean without necessarily being microbiologically clean.
- **Microbiologically clean:** When numbers and types of micro-organisms are reduced to an acceptable level. Microbiological cleanliness is accomplished by effective cleaning and disinfection.

Definitions for chemically, physically and microbiologically clean can be:

- **Chemically** – The breakdown/removal of chemicals used for cleaning and/or disinfection. Water used for rinsing must be potable, e.g. of such chemical and microbiological

quality that it is wholesome and fit for human consumption.

- **Physically** – When all "soil", scale or residues have been removed by cleaning. This is usually judged visually and it is important to remember that a surface which looks clean physically is not necessarily microbiologically clean.
- **Microbiologically** – When the numbers and kinds of micro-organisms are reduced to an acceptable level.

The cleanliness of milk contact surfaces may be determined by various methods, e.g. swabs. These monitoring tests contribute towards the production of high quality raw milk as well as ensuring compliance with legal requirements. Water used for rinsing must be potable, e.g. of such chemical and microbiological quality that it is wholesome and fit for human consumption.

6.1 GENERAL HYGIENE

An effective cleaning and disinfection programme for the milking shed is essential to ensure the production of high quality and safe milk. The cleaning and disinfection programme is one of the pre-requisite programmes required for the implementation of an effective food safety system.

ISO/TS 22002-3

5.9 Cleaning

In farming facilities, the organisation shall maintain the degree of hygiene that is necessary to minimise the likelihood of food contamination. It shall maintain the cleanliness of the surfaces of all premises and equipment including transport containers, which may constitute a source of food contamination (e.g. surfaces in direct contact with food). Cleaning shall not result in food contamination. Cleaning and disinfection shall be effective in achieving the degree of cleanliness required.

Regulation R961

Milking sheds

6. (1) (iv) A scullery for the washing, cleaning, disinfection and sterilisation of milk containers and other unfixed apparatus and equipment used in the handling of milk.

Milk containers and milking machine

7. (5) Milk containers and other fixed and unfixed apparatus and equipment shall be so washed and disinfected after use that they are clean, that fats and milk residues are dissolved and removed and that the bacteriological count on surfaces coming into contact with milk does not exceed ten bacteria per 100 square millimetres of such surfaces after disinfection. The swabbing of the contact surfaces shall be conducted according to SABS Standard Test Method 763: Efficacy of Cleaning Plant, Equipment and Utensils: Swab Technique.

SANS 10049

7.2.11.5 Storage facilities for substances used for cleaning and disinfection

Substances used for cleaning and disinfection, and the equipment for their application, shall be stored in a room in which no foodstuff, food-handling equipment, packaging materials or food containers are stored, and shall at no time come into contact with food containers, packaging materials, raw materials or the food product. All substances used for cleaning

and disinfection shall be prominently and distinctly labelled.

7.2.14 Facilities for cleaning and disinfection

7.2.14.1 Facilities with proper drainage shall be provided for the cleaning and disinfection of the premises of the food-handling organisation and its portable equipment and utensils, and shall be made available at convenient and acceptable points.

7.2.14.2 Equipment for the cleaning and disinfecting facilities shall be constructed of corrosion-resistant materials and shall be of a design that is easily cleanable.

7.2.14.3 Such facilities shall be located in a separate room or in a designated area where there is an ample supply of cold potable water and hot water, where required, or saturated steam.

7.2.14.4 Materials used for cleaning and disinfection, hot and cold running water or saturated steam, hose pipes, spray nozzles, brushes, scrapers and any other equipment needed for the cleaning of the food-handling organisation, and its equipment and utensils shall be made available.

7.2.14.5 These materials and equipment (see 7.2.14.4) shall not be stored in a room where food-handling equipment is stored and shall at no time come into contact with raw materials, the food or their containers or packages.

7.2.14.6 Where used, cleaning in place (CIP) systems shall be designed with sufficient flow rates, contact time and temperature control to allow proper cleaning of the equipment. Where sections of the food contact areas are cleaned during food handling, there shall be a suitable break to atmosphere designed into the piping to prevent the contamination of the food by CIP liquids.

7.4.5 Cleaning and disinfection

7.4.5.1 The food-handling areas shall be main-

tained in an appropriate and suitable state of cleanliness at all times. These areas shall include food storage areas and waste areas.

7.4.5.2 A documented cleaning and disinfection programme for the premises, equipment, containers and vehicles shall be established and implemented.



7.4.5.3 Special precautions shall be taken when cleaning machinery or equipment is used for moist and semi-moist food in order to avoid fungal and bacterial growth.

6.1.1 Cleaning and disinfection programme

A written cleaning and disinfection programme should be available to specify the following:

- Area and items/equipment to be cleaned.
- Frequency of cleaning.
- Person responsible.
- Cleaning equipment used.
- Specific work instruction (WI) or standard operating procedure (SOP) to be used.

The procedures for cleaning and disinfection should be properly established by after-consultation with the chemical supplier of detergents and disinfectants. The procedure for cleaning and disinfection should be designed to meet the particular needs of the specific milking shed and should be set out in writ-

ten schedules that should be made available for the guidance of employees and management. Procedures should be established not only for cleaning and disinfecting the facilities and equipment, but also for the cleaning and disinfecting of the equipment that is used for cleaning, such as brooms and buckets.

There should be adequate supervision by management to ensure that the procedures set out are carried out in an effective manner at all times. An individual who is a permanent staff member should be appointed to be responsible for cleaning and disinfection procedures and for supervision. The effectiveness of the programme must be verified and records of effective cleaning and implementation of the cleaning programme shall be maintained.

ISO/TS 22002-3

5.9 Cleaning

The organisation shall:

- a) Identify premises and equipment that need to be cleaned.
- b) Appoint competent personnel to perform cleaning.
- c) Establish operating procedures for the cleaning of surfaces that are potentially in contact with food products and feed — the operating procedures shall include, depending on the operations carried out, the nature of the product and type of surface material:
 1. A description of the cleaning process (e.g. steps involved, temperatures, times).
 2. The cleaning frequency appropriate to the use of the area, equipment, etc.
 3. The names (e.g. trade names) of cleaning and disinfecting products used and which have been approved for food contact usage.
 4. The quality of the water used, which depends on the equipment cleaned and on the type of products likely to be contaminated.
 5. The verification criteria that determine the cleanliness required.

The organisation shall follow the manufacturer's instructions when using sanitisers (e.g. method of preparation, including concentration, temperature of use, mechanical action required, i.e. turbulence, scrubbing) to remove soil and biofilm, waiting time before rinsing, if any, and withholding period before contact with food or food producing animals, if any).

Depending on the operations and where appropriate to minimise the likelihood of food contamination, examples of PRPs that should be implemented are to:

- a) Clean the milking equipment (lines and teat suction cups) after every milking and the milk storage containers after each emptying, when there is a likelihood of milk contamination from milk residues or biofilms.
- b) Rinse the milking equipment and storage containers with potable water when there is a likelihood of contamination with residues of detergents used for cleaning.
- c) Use clean water for disinfection activities.
- d) Clean equipment that could act as vectors of cross-contamination with chemicals.
- e) Prevent containers, equipment and facilities that have been used for storing, transporting, mixing or spreading potentially hazardous material (e.g. plant protection products or medicated feed) from being reused for food or feed, unless a cleaning procedure validated to be effective in removing the hazardous material has been applied.
- f) Clean and, where necessary, disinfect buildings once all animals in the building concerned have been moved to another rearing location or slaughterhouse, to ensure an effective maintenance of an appropriate degree of hygiene and protection against the transmission of animal diseases.
- g) Prevent animals from being introduced into the facilities during an appropriate drying out period after cleaning or disinfection.
- h) Maintain troughs and automatic feeders at an appropriate level of hygiene.

Documentation should include operating procedures for the cleaning of surfaces that can come in contact with food products and feed. If the organisation detects quality problems in farm end-products that may be caused by failure in or ineffective cleaning, the cleaning operating procedure in question shall be reviewed and amended as necessary.

SANS 10049

7.4.5.5 Cleaning and disinfection programmes shall include as a minimum:

a) Areas and equipment to be cleaned and disinfected

b) Frequency of cleaning and disinfection

For example, cleaning and disinfection could be carried out daily, weekly, monthly, quarterly, hourly or during shutdown periods. The frequency of cleaning and disinfection shall be sufficient to ensure the maintenance of the required standard of hygiene.

Note: Clean-as-you-go practices may be applied.

c) Methods of cleaning and disinfection

1. A pre-determined sequence of cleaning shall be established. Cleaning methods shall include removal or disassembly requirements, dry cleaning, wet cleaning, and disinfection at the recommended contact time, temperature and concentration of the disinfectant as stipulated by the disinfectant manufacturer.
2. When cleaning and disinfection take place during food handling, these areas being cleaned and disinfected shall be physically separated from the food-handling areas in order to prevent the contamination of the product with cleaning and disinfecting agents.
3. Where appropriate, recommended cleaning materials (especially related to the fabric and chemical resistance) shall be specified. Where dismantling is required, specific instructions shall be provided.

4. In food-handling areas, compressed air shall not be used for cleaning purposes.

d) Cleaning and disinfecting agents

1. All cleaning and disinfecting agents used shall be appropriate for their intended purpose and shall be suitable for use in food-handling areas.
2. Household cleaning chemicals and chemicals from non-reputable suppliers shall not be used. Disinfectants shall be registered by an appropriate regulatory authority.
3. The current Material Safety Data Sheets (MSDS) of cleaning chemicals and disinfectants shall be made available on the premises of the food-handling organisation, and acids and alkalis shall be stored and handled in accordance with these documents.

Note: SANS 1828 and SANS 1853 give details on the requirements and safety of cleaning chemicals, disinfectants and detergent-disinfectants used in the food industry.

e) Cleaning tools and equipment

1. Cleaning tools and equipment shall be clearly distinguishable for different areas, shall be of hygienic design, and shall be made of suitable impervious material that will not present a potential source of contamination. All cleaning equipment shall be cleaned and stored properly when not in use.

f) Monitoring and verification procedures

1. The food-handling organisation shall be responsible for establishing a procedure for the monitoring of all cleaning at defined frequencies.
2. The effectiveness of the cleaning and disinfection procedures shall be verified by appropriate methods.
3. The efficacy of the cleaning and disinfection process shall be tested in accordance with SANS 5763. When scored by the system set out

in SANS 5763, the determined percentage efficacy of cleaning and disinfection in the sample shall be deemed acceptable.

4. Effective measures shall be taken to inhibit mould growth and to remove dust, flaking paint and other loose or detachable material likely to fall onto the food product from walls, ceilings or overhead structures in the preparation, processing, packaging and storage areas.

g) Cleaning programme records

Records of effective cleaning and implementation of the cleaning programme shall be maintained.

CLEANING AND DISINFECTION IN THE MILKING PARLOUR

The parlour shall be clear of products, cleaning chemicals, disinfectants or other items not used on a daily basis.

After each milking the parlour should be washed and cleaned. A water point with running water and attached hose, specific to the parlour or an alternative method (e.g. a power washer), must be available in order to allow for the washing of the entire milking parlour area.

- Troughs shall be free from any build-up of cake and/or mould.
- Rails shall be cleaned.
- Collecting yard, close to the parlour entrance and walls, shall be cleaned.
- All walls and overhead structures within the parlour shall be cleaned.

Airborne and accumulated dust

The parlour should be free from dust, cobwebs and rust. A thin film of dust is acceptable, although evidence of ingrained or caked dust/dirt does not indicate irregular or ineffective cleaning. Checks for cleanliness and absence of dust should also be considered on:

- Jars
- Transfer pump

- Pipe work
- Vacuum lines
- Feeders

Ducts, jars and pipe work should be clean and properly maintained.

- Clusters and hoses must be clean both internally and externally.
- The interior cleanliness of the milk machine will be reflected by lower total bacteria and coliform counts.
- Dung should be washed from surfaces and equipment after each milking.
- Rubber ware must be checked regularly for signs of perishing. Effective cleaning will not take place if equipment is not well-maintained.
- Milk stone remover should be used as dictated by local conditions to prevent build-up of lime scale.

The cleaning and disinfection routine of milking machines may differ due to the different manufacturers and suppliers of cleaning chemicals. It is best to consult with the supplier of cleaning chemicals and the machine manufacturer to compose the best cleaning routine for the parlour shape, size and make. It is therefore of the utmost importance to use a reliable supplier of cleaning chemicals that will offer this very important service.

The supplier of cleaning chemicals should be an integrated part of the cleaning routine by supplying cleaning programmes and material safety data sheets for each product in his range. The following shall be available:

- Sufficient hot running water to facilitate cleaning for the size of milking machine.
- SABS-registered cleaning chemicals and disinfectants.
- A documented cleaning procedure for the milking machine.
- A documented cleaning procedure for the manual cleaning or cleaning out of place (COP).
- Records for the effective implementation of the cleaning programme.

Records shall include evidence of:

- The concentration of cleaning chemical or disinfectant.
- The water temperature.
- The contact time.
- Inspection performed after cleaning.

CLEANING AND DISINFECTION IN THE MILK ROOM

After each milking the milk room and the equipment should be cleaned and disinfected. All walls, doors, ceilings, overhead structures, windows, fly screens and wash basins shall be cleaned. The milk room should be free from dust, cobwebs and rust. The cleaning and disinfection routine of the bulk tank may differ due to the different manufacturers and suppliers of cleaning chemicals. It is best to consult with the supplier of cleaning chemicals and the bulk tank manufacturer to compose the best cleaning routine. The milk room should be clear of products, cleaning chemicals, disinfectants or other items not used on a daily basis.

The following shall be available:

- Sufficient hot running water to facilitate the cleaning of the bulk tank and other equipment.
- SABS-registered cleaning chemicals and disinfectants.
- A documented cleaning procedure for the bulk tank, including the exterior of the bulk tank and manual cleaning of other equipment.
- A documented cleaning procedure for the manual cleaning or cleaning out of place (COP).
- Records for the effective implementation of the cleaning programme.

CLEANING PROCEDURES

Cleaning operations must be performed strictly according to a carefully worked out procedure in order to attain the required de-

gree of cleanliness. This means that the sequence must be exactly the same every time. The cleaning cycle in a dairy comprises the following stages:

Pre-rinsing with water

Pre-rinse with water to remove loose dirt and milk residues immediately after milking or after milk was removed from bulk tank. Milk fat residues are more easily flushed out if the pre-rinsing water is warm, but the temperature should not exceed 55°C to avoid the deposit of proteins. Pre-rinsing must continue until the water leaving the system is clear, as any loose dirt left will increase detergent consumption and inactivate chlorine, if used, in the detergent.

Cleaning with detergent

Cleaning is usually performed with alkaline (removal of milk residue) and acid detergents (removal of milk stone). The detergent must also be capable of dispersing dirt and encapsulating the suspended particles to prevent flocculation. A number of variables must be carefully controlled to ensure satisfactory results with a given detergent solution. These are:

- **The concentration of the detergent solution.**

The amount of detergent in the solution must be adjusted to the correct concentration before cleaning starts. During cleaning, the solution is diluted with rinsing water and milk residues. Some neutralisation also takes place. It is therefore necessary to check the concentration during cleaning. Failure to do this can seriously affect the result.

Checking can be done either manually or automatically. The dosage must always be according to the detergent supplier's instructions, as increasing the concentration does not necessarily improve the cleaning effect – it may indeed have the reverse effect due to foaming, etc. Using too much detergent simply makes cleaning needlessly expensive.

Records of the verification of the concentrations should be kept.

- **The temperature of the detergent.**

Generally speaking, the effectiveness of a detergent solution increases with increasing temperature. A blended detergent always has an optimum temperature which should be used. The ideal temperature for using a chlorinated detergent is $\pm 60^{\circ}\text{C}$. If the temperature drops below 40°C , milk fat may re-deposit or a film could form on the surface. The temperature must always be according to the chemical supplier's instruction. The temperature needs to be determined during and at the end of the wash cycle. Records should be kept.

- **The mechanical effect on the cleaned surfaces.**

The turbulence of the solutions moving through the milking machine areas must be strong enough to remove residue sticking to the surfaces of the equipment. In manual cleaning, scrubbing brushes are used to produce the required mechanical scouring effect. In mechanised cleaning of pipe systems and tanks, mechanical effect is supplied by the flow velocity. The circulating pumps must be according to the specifications of the milking machine manufacturers.

- **The duration of cleaning (time).**

The duration of the cleaning procedure is important and must be indicated on the cleaning programmes. The rate at which the cleaning solution's temperature decreases will be affected by the washing time and the temperature difference between winter and summer seasons.

The duration of the detergent cleaning phase must be carefully calculated to obtain the optimum cleaning effect. At the same time the costs of electricity, heating, water and labour must be taken into consideration. It is not sufficient to flush a pipe system with a

detergent solution. The detergent must circulate long enough to dissolve the dirt. The time depends on the thickness of the deposits and the temperature of the detergent.

A ten-minute treatment with alkaline detergent, at the correct temperature and concentration, is usually sufficient to dissolve the milk residue and soil on the walls of a milk tank.

Rinsing with clean water

After cleaning with detergent the surfaces must be flushed with water long enough to remove all traces of the detergent. Any detergent left in the system after cleaning may contaminate the milk. All parts of the system must be thoroughly drained after rinsing.

The equipment and pipe systems are practically sterile after the treatment with strong alkaline and acid solutions at a high temperature. It is then necessary to prevent overnight growth of bacteria in the residual rinsing water in the system. This can be done by acidifying the final rinse water to a pH of 5 by adding phosphoric or citric acid. This acid environment is not favourable for the growth of most bacteria.

Disinfection

Properly carried out cleaning with acid and alkaline detergents renders the equipment not only physically and chemically but also, to a large extent, lowers the bacteriological count. The bacteriological cleaning effect can be further improved by disinfection which leaves the equipment virtually free from bacteria.



Other factors influencing the effectiveness of the cleaning programme include:

1. Water quality

Safe, clean water must be available for cleaning. The water must be tested to indicate compliance with SANS 241 standards. Water quality and hardness determine the type of cleaning agents required:

- Total water hardness < 120ppm.
- pH 7.
- Low organic content.
- A microbial count of < 1000cfu.

2. Solubility of soil

Soil types are soluble in varying conditions:

- Water soluble, e.g. sugars and some salts.
- Soluble in alkali cleaning chemicals, e.g. fats and proteins.
- Soluble in acids, e.g. mineral deposits.

Most soils are complex and contain all three types of solubility.

Use	Product	Code	Hazard-Neet	Dilution
Detergent	Chlorpower	Chlorinated Alkali		1% or 1cup per Litre
Sanitiser	Perasan	Acid		0.5% or 1 cup per 25L

SANS 10049

7.4 Hygienic operating requirements

7.4.1 Water

7.4.1.1 Water used as a food product ingredient, including as ice and steam, or in contact with food contact surfaces, shall comply with the requirements of SANS 241 (regardless of the source of the water). Appropriate facilities for the storage, distribution and, where needed, temperature control of the water, ice and steam shall be provided.

7.4.1.2 Every food-handling area shall have an adequate supply of clean potable water that is free from suspended matter and sub-

stances that could be deleterious to the food product or harmful to health. Non-potable water shall have a separate, identified system that is not connected to and is prevented from reflux into the potable water system.

Cleaning-in-place systems

Cleaning-in-place (CIP) means that rinsing water and detergent solutions are circulated through tanks and pipes without the equipment having to be dismantled. CIP can be defined as circulation of cleaning liquids through machines and other equipment in a cleaning circuit. The passage of the high-velocity flow of liquids over the equipment surfaces generates a mechanical scouring effect which dislodges dirt deposits. This only applies to the flow in pipes, heat exchangers, pumps, valves, etc.

EXAMPLE OF A CLEANING AND DISINFECTING PROCEDURE FOR MILKING MACHINES

1. Remove milk pipe from the milk bulk tank.
2. Rinse complete milk line and milking units with clean, lukewarm water until no milk residue is present.
3. Circulate a 5-10% chlorinated detergent solution through the system for 30 minutes at 60°C (do not allow the temperature to drop below 40°C).
4. Rinse out with clean water to remove all residue.
5. Circulate a cold disinfectant solution for 2-4 minutes. Leave overnight.
6. Rinse with clean water after step 5 or before the next milking session.

The normal technique for cleaning large tanks is to spray the detergent on the upper surfaces and then allow it to run down the walls. The mechanical scouring effect is then often insufficient, but the effect can to some extent

be improved by the use of specially designed spray devices. Tank cleaning usually requires large volumes of detergent, which must be circulated rapidly.

Descaling must be done with an acid once a week between step 4 and 5. The same washing programme can be used to clean and disinfect an auto-cleaning bulk tank.

MANUAL CLEANING OF EQUIPMENT, CANS, TRANSPORT TANKS, BULK TANKS AND HAND MILKING EQUIPMENT

1. Rinse out with clean water.
2. Hand-wash with a chlorinated detergent, leave for five minutes and rinse off.
3. Rinse or hand-spray all surfaces with a cold disinfectant solution and leave to air-dry.
4. Rinse with clean water before using the equipment again.
5. Remember to inspect all areas before disinfecting after cleaning.

The concentrations, temperatures and contact time should be determined by the chemical supplier.



6.1.2 Cleaning equipment

All cleaning equipment should be in a good condition, clean and well-maintained. No wooden equipment should be used. The equipment should be stored in such a man-

ner that it prevents contamination and to increase the durability of the equipment after cleaning, e.g. on special wall brackets.

Clear differentiation should be made between cleaning equipment used in the milking parlour and those used in the milking room to prevent cross-contamination. The equipment used in the different areas will be stored separately and in such a manner to ensure availability where it is needed. The equipment should be suitable for the area or equipment where it will be used, e.g. bulk tank brush.

The implementation of such a storage system will assist in:

- Reducing the risk of cross-contamination.
- Contributing to a reduction in cleaning costs.
- Increase the lifespan of the cleaning equipment.
- Assisting the users to a responsible attitude towards hygiene problems.
- Separating the different areas, e.g. by means of colour coding.
- Differentiate between cleaning equipment used on floors and these used for cleaning the inside of equipment.

The use of cleaning cloths and scouring pads is not advised due to the risk of cross-contamination, e.g. by being contaminated themselves or by being a source of foreign materials. If cloths are used, care should be taken to ensure that they are used only if they are laundered and disinfected or sterilised according to a documented schedule. Alternatively, disposable cloths or paper towels can be used.

7 e) Cleaning tools and equipment

1. Cleaning tools and equipment shall be clearly distinguishable for different areas, shall be of hygienic design and shall be made of suitable impervious material that will not present a potential source of contamination.

All cleaning equipment shall be cleaned and stored properly when not in use.

2. Sufficient tanks for the complete immersion of loose pieces of equipment and hoses shall be made available.

Equipment shall not be cleaned in the milking machine basin due to the risk of cross-contamination.

6.1.3 Cleaning chemicals and disinfectants

Cleaning chemicals and cleaning procedures should not be a risk for food safety or product quality. Chemicals should adhere to the relevant legislation. Cleaning chemicals and disinfectants used in the milking shed shall be SABS-approved for use in the food industry. SANS 1828 (Cleaning chemicals for use in the food industry) and SANS 1853 (Disinfectants and Detergents-Disinfectants for use in the food industry) give details on the requirements and safety of cleaning chemicals, disinfectants and detergent-disinfectants used in the food industry. No household chemicals or chemicals from non-reputable suppliers shall be used. The material safety data sheets (MSDS) and/or technical data sheets (TDS) shall be available.

The following guideline will give an indication of the basic requirements:

1. All cleaning chemicals and disinfectants must comply with the following standards:

SABS (SANS) permit to apply the mark, SABS schedule with the names of the cleaning chemicals and disinfectants, SABS certificates shall be valid, all disinfectants must be registered in terms of the compulsory registration requirements.

2. Product containers and labelling:

Bulk product containers must be labelled to reflect the contents. All individual containers

must be labelled with the supplier's name, registration numbers, SABS code (SANS 1828 and/or SANS 1853 certification) and instructions for use as well as safety details.

3. No fragrant products may be used.

4. Material safety data sheets must be available for all products used.

5. Chemical supplier must provide the following training:

- Correct use of chemicals.
- Safety handling of chemicals.
- Personal hygiene.
- Cleaning practices.
- Cleaning schedules.
- Cleaning methods (CIP, hand cleaning).

6. An operations manual must be compiled by the chemical supplier. The file must contain the following information:

- *Occupational Health and Safety Act 85 of 1993* (acceptance letter).
- Copies of SABS registration certificates.
- Product data and safety sheets.
- Training record for personnel.

Safe storage of chemicals

The chemical storage area should be locked, well-lit and ventilated and clearly demarcated for chemical storage. All acidic products should be isolated from chlorinated, alkaline and neutral products. All documents regarding the chemicals issued must be available. The different containers must not be stacked upon one another, leaving space between them. Ensure that all the drum lids are placed back and that bags are wrapped closed. Oxidising agents should be stored away from organic material such as wood and cardboard.

No flammable material and other farm chemicals are allowed in the same storage room. The

dosing cups must be stored close to the containers. Access to the chemical room should be limited to trained personnel. Monitor the use of chemicals. Chemicals should be ordered in time to ensure that the wrong chemicals are not used. All chemicals need to be issued by a dedicated person.

SANS 10049

7.2.11.5 Storage facilities for substances used for cleaning and disinfection

Substances used for cleaning and disinfection, and the equipment for their application, shall be stored in a room in which no foodstuff, food-handling equipment, packaging materials or food containers are stored, and shall at no time come into contact with food containers, packaging materials, raw materials or the food product. All substances used for cleaning and disinfection shall be prominently and distinctly labelled.

7.4.5.5 (d)

1. All cleaning and disinfecting agents used shall be appropriate for their intended purpose and shall be suitable for use in food-handling areas.

2. Household cleaning chemicals and chemicals from non-reputable suppliers shall not be used. Disinfectants shall be registered by an appropriate regulatory authority.

3. The current Material Safety Data Sheets (MSDS) of cleaning chemicals and disinfectants shall be made available on the premises of the food-handling organisation, and acids and alkalis shall be stored and handled in accordance with these documents.

6.2 PERSONAL HYGIENE

Personal hygiene deals with the requirements on hand washing, prohibitions on spitting, smoking and eating in food-handling areas as well as the wearing of protective clothing. It also deals with the aspect of specified diseases and inspections on employees for cuts or sores.

Management must ensure that effective personal hygiene procedures and practices are implemented. The most effective way to deal with this is to present all new employees with an induction programme and then to reinforce it through means of posters, clear instructions in ablution blocks, changing rooms and hand-washing facilities in the processing facility. There must be sufficient ongoing supervision of personal hygiene procedures to ensure that everyone complies with these procedures. Management itself must set a good example in order to achieve the proclaimed standards.

Regulation R961

Personnel hygiene – Milkers and handlers of milk

10. (1) In addition to sub-regulation 6(4), personal hygiene facilities shall be made available to ensure that an appropriate degree of personal hygiene can be maintained and to avoid contaminating milk, where appropriate facilities shall include:

- (a) Adequate means of hygienically washing and drying hands, including hand-wash basins and a supply of hot and/or cold water, soap and disinfectant.
- (b) Toilets of appropriate hygienic design.
- (c) Adequate changing facilities for personnel.

(2) Such facilities shall be suitably located and designed.

(3) The hands and fingernails of every milker or handler of milk shall be washed thoroughly with soap and water, and there shall be no accumulation of grime under the nails when milk is handled.

(4) Each person handling milk, shall daily before the commencement of activities or work put on clean and undamaged over-

clothes and gumboots and wear them continuously while he is handling milk in the interests of milk safety and suitability to use.

(5) Milk shall not be handled by any person:

- (a) Who has on his or her body a suppurating abscess, sore, cut or abrasion, unless such abscess, sore, cut or abrasion is covered with a moisture-proof dressing which is firmly secured to prevent contamination of the milk.
- (b) Who is suspected of suffering from or being a carrier of a disease or condition in its contagious stage that can be transmitted by food or animals, unless any such person immediately reports the disease or condition to the person in charge and a certificate by a medical practitioner stating that such person is fit to handle food is submitted.
- (c) Whose hands or clothing are not clean.

ISO/TS 22002-3

5.5 Personnel hygiene

Personnel shall maintain an appropriate degree of personal cleanliness and behave and operate in a manner that is appropriate to the required degree of hygiene. The organisation shall maintain a level of personal competency that is sufficient to implement this requirement.

The organisation shall:

- a) Establish and communicate practices for personal cleanliness, behaviour and operation that are appropriate to the operations carried out.
- b) Maintain communication and personal competency (including temporary personnel) that implement and maintain these practices.
- c) Whenever appropriate, maintain practices to ensure that visitors do not represent a source of contamination.

Depending on the operations and where appropriate to minimise the likelihood of food contamination, examples of PRPs that should be implemented are designed for personnel to:

1. Wear suitable protective clothing, head coverings and footwear that are cleaned or changed regularly.
2. Wash hands frequently, with or without specifying when (e.g. after visits to toilet, prior to handling of food, milking or collection of eggs).
3. Promote the voluntary reporting of personal health conditions that may contaminate foodstuffs and animals.
4. Cover injuries on hands or forearms with suitable waterproof dressings.
5. Prohibit smoking in areas where food products are handled.
6. Restrict personal belongings brought into food-handling areas.
7. Restrict entry to the farm.
8. Train on the use of chemical products (e.g. plant protection products).
9. Train on harvesting and handling of specific products (e.g. milking, fish harvesting, placing poultry into crates, egg handling, handling of fragile fruits).
10. Ensure effective communication on hygiene practices, e.g. graphical display of hand-washing technique.

Documentation should include a description of the personal hygiene practices applicable.

SANS 10049

7.5.3 Personal hygiene and personal effects

7.5.3.1 All the health requirements for food-handling personnel shall comply with the relevant national legislation (see foreword and Annex A).

7.5.3.2 Before being engaged, employees shall pass an appropriate medical examination to ensure that they are free from communicable diseases, and shall thereafter pass an annual

medical examination (see 7.5.3.1).

7.5.3.3 Appropriate systems shall be in place to proactively manage the health of all personnel to ensure compliance with the relevant national legislation (see foreword and Annex A) and with food safety requirements.

7.5.3.4 No member of the food-handling personnel known to be a carrier of or suspected to be a carrier of, or to have been in contact with people that are infected with, any communicable disease, especially a carrier of *Salmonella* or *Shigella*, or one who shows symptoms of, or is suffering from, gastroenteritis or an enterobacterial infection, or a disorder or condition that causes discharge of fluid from any part of the skin or body shall be allowed to enter any food-handling area or permitted to use facilities used by food-handling personnel. Any such employee shall immediately report to the management of the food-handling organisation. Note: The Department of Health has all the information regarding communicable diseases.

7.5.3.11 Food-handling personnel shall, at all times, maintain a high degree of personal cleanliness and conform to hygienic practices while on duty. They shall be trained and educated in personal cleanliness and hygienic practices. Adequate control shall be exercised to ensure that employees are in compliance with the hygienic requirements (such as supervision at the hand-washing facilities) before commencing work at the beginning of a work shift and after breaks.

7.5.3.12 Before starting work, after each absence from the food-handling areas, at regular intervals during food handling or at any time when necessary, food-handling personnel shall wash their hands with warm water and an acceptable unscented liquid soap or hand-cleaning detergent (see 7.2.8), and rinse them in clean, running water. Disinfection of hands shall be implemented where necessary.

7.5.3.13 Hygiene facilities shall be suitably maintained in a functional state and supplied with soap, soap dispensers, disinfectors, drying equipment and waste receptacles at all times.

7.5.3.14 Containers used in the preparation, processing or packaging of the food product shall not be used for any other purpose.

7.5.3.15 Neither personnel's personal effects nor their food shall be present in any area where the food product and its ingredients and packaging materials are handled and stored. Their personal effects, including their personal clothes, shall be kept in lockers or hangers provided for this purpose in the change rooms (see 7.2.12.1).

7.5.3.16 The use of chewing gum and tobacco (in any form) shall not be permitted within areas where the food product and its ingredients and packaging materials are handled or stored. Spitting shall not be allowed anywhere within the premises of the food-handling organisation. Notices to that effect shall be posted strategically (see 7.5.4).

7.5.3.17 Neither varnish nor lacquer shall be used on fingernails, and fingernails shall be kept short and clean. False eyelashes and false fingernails shall not be worn.

7.5.3.18 Jewellery, except for plain wedding bands which need to be suitably covered, shall not be worn by employees who handle raw materials or the unprotected food product (or both). Types of jewellery which may be worn, taking into account religious, ethnic, medical and cultural imperatives, shall be specified. Control measures to minimise the risks presented by permitted jewellery shall be in place.

7.5.3.19 Pets shall not be permitted on the premises of a food-handling organisation.

6.2.1 Illness and injuries

People known, or suspected, to be suffering

from or to be a carrier of a disease or illness likely to be transmitted through milk, should not be allowed to enter any milk-handling area if there is a likelihood of them contaminating food. Any person affected should immediately report illness or symptoms of illness to the management. A medical examination of a food handler should be carried out if clinically or epidemiologically indicated.

Conditions which should be reported to management so that any need for medical examinations and/or the possible exclusion of personnel from milking and milk handling can be considered include:

- Jaundice.
- Diarrhoea.
- Vomiting.
- Fever.
- Sore throat with fever.
- Visibly infected skin lesions (boils, cuts, etc.).
- Discharges from the ear, eye or nose.
- TB, coughing.

An illness agreement should be explained to and signed by all personnel. Annual medical examinations shall be conducted to ensure that all personnel are fit to handle milk. A daily hygiene inspection must be implemented. Hands should be inspected for sores, cuts and infections. If personnel have sores, cuts or infections, it needs to be cleaned and a waterproof plaster should be issued.

Should the facility issue gloves with the plaster, effective management of the gloves must be implemented, e.g. washing and/or disinfection, and inspection to ensure that the gloves are still intact. The plaster, and glove when applicable, must be issued and be replaced with every milking. All gloves must be safely disposed of when leaving the production area. Plasters need to be readily available at the milking shed, e.g. in first-aid kits. These first-aid kits must be clearly displayed and labelled, and must be kept fully stocked with adequate first-aid equipment and instructions.



Records of illnesses, cuts and sores should be implemented.

ISO/TS 22002-3

5.5 Personnel hygiene

People known to be infected with, or carrying, a disease or illness transmissible through food or food-producing animals shall be prevented from handling food-producing animals, foods and materials which come into contact with food.

SANS 10049

7.5.3 Personal hygiene and personal effects

7.5.3.5 The management shall ensure that no employee who is known or suspected to be affected with a disease capable of being transmitted through food shall be permitted to work in any part of the food-handling organisation in a capacity in which there is a likelihood of the employee contaminating the food product with pathogenic organisms.

7.5.3.6 All personnel shall report health issues to a nominated person, who will have the responsibility and authority to take the most appropriate action.

7.5.3.7 In the case of any absence of more than one day owing to illness, the employee shall, before resuming duty, report the nature of the illness that necessitated his or her absence to the organisation's hygiene officer, who shall,

should he or she deem it necessary, take the appropriate steps to obtain a medical opinion on the employee's fitness for work.

7.5.3.8 An appropriate medical record of each employee shall be kept. Medical records and medical certificates submitted by an employee of a food-handling organisation shall be made available for inspection by the authority administering this standard.

7.5.3.9 The management shall ensure that no employee who is suffering from a cut, injury, infected wound or infected skin irritation shall be allowed to come into contact with the food product or food contact surfaces, unless the cut or injury has been treated or dressed by suitable waterproof dressings in a colour different from the food being handled and is controlled in such a way that the discharge of body fluid is prevented, and the wound and its dressing are covered in such a way to ensure that the infection or the contamination of the food product is no longer possible.

7.5.3.10 Appropriate first-aid equipment shall be provided. First-aid personnel shall be made available and shall be appropriately trained.

6.2.2 Personal cleanliness

Food handlers should maintain a high degree of personal cleanliness and, where appropriate, wear suitable protective clothing, head coverings and footwear. Cuts and wounds, where personnel are permitted to continue working, should be covered with suitable waterproof dressings.

Personnel should always wash their hands when personal cleanliness may affect food safety, for example:

- At the start of food-handling activities.
- Immediately after using the toilet.
- Before udder preparation.
- After a dirty udder had been cleaned.
- After handling raw food or any contaminated material.

6.2.3 Personal behaviour

People engaged in food-handling activities should refrain from behaviour, which could result in the contamination of food, for example:

- Smoking.
- Spitting.
- Chewing or eating.
- Sneezing or coughing.
- Wearing jewellery.

No smoking, eating, drinking and jewellery signs should be posted in the milk room and milking parlour.

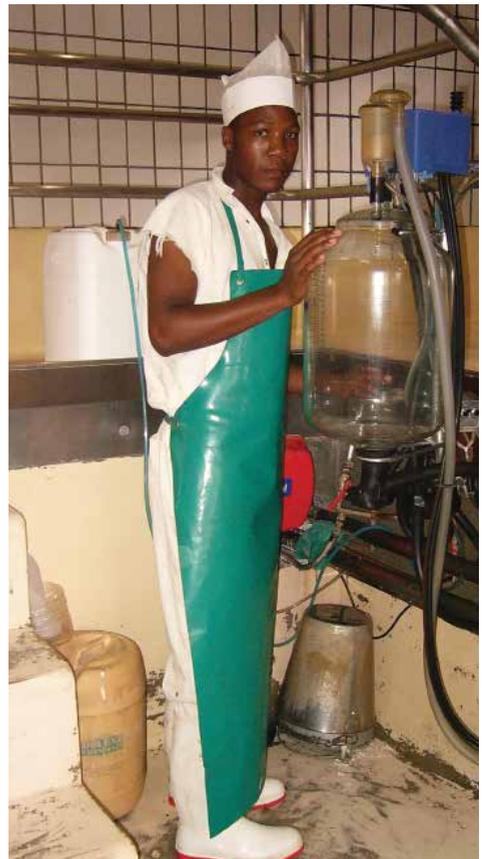


6.2.4 Protective clothing

It is the responsibility of management to provide personnel with clean and well-maintained protective clothing. The protective clothing should not be removed from the milking shed premises by the personnel to be washed and should not be worn while doing any other work on the farm.

Protective clothing should include, as a minimum, gumboots, an apron and overalls, preferably a two-piece. This should preferably be white. A dedicated area for the hygienic storage of the protective clothing and gumboots should be available. This area should ensure that the protective clothing will not be contaminated during storage. These clothes should stay at the parlour and should be washed on site with clean hot water.

Cleaning equipment must be provided for the effective cleaning of the gumboots. Gumboots should be kept clean and in good repair. It is considered best practice that such footwear is not worn outside the milking parlour or milk room. If possible, dedicated personnel should enter the milk room and not the milkers.



Regulation R961

Personnel hygiene – Milkers and handlers of milk

10. (4) Each person handling milk, shall daily before the commencement of activities or work put on clean and undamaged over-clothes and gumboots and wear them continuously while he is handling milk in the interests of milk safety and suitability to use.

6.2.5 Change room

Regulation 1256

6 (4) A change room shall:

(a) Comply mutatis mutandis with sub-regulation (2)(e), (i), (f), (g), (h) and (i).

(b) Have at least one hand basin and shower provided with hot and cold running water, soap disinfectant and disposable towels, and the used water from such hand-wash basin and shower shall adequately drain into a disposal system.

(c) Be within easy reach of the milking parlour and milking room.

(2) (e) Where walls are provided, the exterior walls:

(i) Shall be at least 2,4 metres high on the inside.

(f) The interior surfaces of the walls, if provided, shall be made of impervious materials with no toxic effect in intended use.

(g) The ceilings, if provided, or overhead structures and fixtures shall be constructed and finished to minimise the build-up of dirt and condensation, and the shedding of particles.

(h) The floors shall be constructed to allow adequate drainage and cleaning.

(i) Shall be adequately ventilated and illuminated.

6.2.6 Personnel hygiene facilities

Regulation R961

Personnel hygiene – Milkers and handlers of milk

10. (1) In addition to sub-regulation 6(4), personnel hygiene facilities shall be made available to ensure that an appropriate degree of personal hygiene can be maintained and to avoid contaminating milk, where appropriate facilities shall include:

(a) Adequate means of hygienically washing and drying hands, including hand-wash basins and a supply of hot and/or cold water, soap and disinfectant.

(b) Toilets of appropriate hygienic design.

(c) Adequate changing facilities for personnel.

(2) Such facilities shall be suitably located and designed.

(3) The hands and fingernails of every milker or handler of milk shall be washed thoroughly with soap and water, and there shall be no accumulation of grime under the nails when milk is handled.

Appropriate ablution facilities must be provided to all personnel. Hand-washing facilities should be provided for personnel entering the milk room and milking parlour. The tanker driver must also have access to these hand-washing facilities. These hand-washing facilities should only be used for hand washing and should adhere to the following requirements:

- Instruction sign.
- Hand washing only.
- Hot and cold water.
- Anti-microbial soap.
- Drying facilities such as disposable paper towels.
- Bin used solely for the purpose of paper towel disposal.



SANS 10049

7.2.8 Hand-washing facilities

7.2.8.1 The following shall be provided at the entrances to the food-handling areas that are used by employees, at other conveniently situated places within easy reach of the employees and at the toilet exits:

- a) A sufficient number of hand-wash basins, troughs or washing fountains with an abundant supply of hot and cold or warm potable running water, in the temperature range 40°C to 50 °C, that complies with the requirements of 7.4.1.
- b) a sufficient supply of unscented liquid soap or hand-cleaning detergent and, where appropriate, a hand disinfectant, and to dry hands, single-use disposable paper towels.

7.2.8.2 Hand-washing facilities shall, at all

times, be unobstructed by equipment and operating activities. Hand-wash basins shall be of a suitable corrosion-resistant water-impermeable material, shall have a smooth finish, shall be easy to clean and shall drain directly into drainage channels.

7.2.8.3 Disinfectant hand dips are not recommended but where in use, they shall be of such design that they can be adequately cleaned.

7.2.8.4 Basins designated for hand washing shall be separate from equipment cleaning areas.

7.4 Hygienic operating requirements

7.4.1 Water

7.4.1.1 Water used in contact with food-contact surfaces, shall comply with the requirements of SANS 241 (regardless of the source of the water). Appropriate facilities for the storage, distribution and, where needed, temperature control of the water shall be provided.

7.4.1.2 Every food-handling area shall have an adequate supply of clean potable water that is free from suspended matter and substances that could be deleterious to the food product or harmful to health. Non-potable water shall have a separate, identified system that is not connected to and is prevented from reflux into the potable water system.

6.3 TRAINING

Regulation R961: Personnel hygiene – Milkers and handlers of milk

10 (6) All employees shall be subjected to personal and food hygiene training relevant to the production and handling of milk and in the case of new employees prior to the commencement of handling milk. Records of such training must be made available to an inspector on request.

(7) The holder of a certificate of acceptability for a milking shed shall undergo training on food safety and hygiene aspects of the production and handling of milk by an accredited service provider.

ISO/TS 22002-3

5.5 Personnel hygiene

Personnel shall maintain an appropriate degree of personal cleanliness and behave and operate in a manner that is appropriate to the required degree of hygiene. The organisation shall maintain a level of personal competency that is sufficient to implement this requirement.

The organisation shall:

- a) Establish and communicate practices for personal cleanliness, behaviour and operation that is appropriate to the operations carried out.
- b) Maintain communication and personal competency (including temporary personnel) that implement and maintain these practices.

SANS 10049

7.5 Requirements for personnel engaged in the handling of the food product

7.5.1 Training

7.5.1.1 Personnel engaged in the handling of the food product shall possess sufficient knowledge and expertise to carry out assigned tasks. All personnel shall be competent in the handling and production of safe food.

7.5.1.2 In order to provide personnel with the necessary competencies, training shall be provided, taking into account:

- a) The technical competencies required for the position or operation.
- b) Current skill levels and experience of trainees.

c) The nature of the food product and food-handling activities.

7.5.1.3 Appropriate training regarding the safe handling of food, in accordance with food safety requirements, shall be conducted at the beginning of employment and this training shall be documented.

7.5.1.4 Periodic assessments of the effectiveness of training programmes shall be carried out in addition to routine supervision and checks that procedures are being followed. Records thereof shall be maintained.

7.5.1.5 Records of experience, expertise, educational qualifications and training of the employees concerned shall be maintained.

7.5.1.6 Managers and supervisors shall have the necessary knowledge of food hygiene principles and practices, as well as of the relevant food safety requirements, to enable them to judge potential hazards and to take the necessary action(s) to remedy non-conformities.

Implementing a training programme for the food handlers working on a dairy farm is essential for the implementation of an effective food safety system. Every farmer and every employee of a dairy farm must have the technical knowledge necessary to perform his job correctly. It is essential that every milk producer regularly ensures that all the personnel operate at a sufficient competency level. This will include all internal training, training provided by cleaning chemical suppliers, milking equipment suppliers as well as other relevant external training.

Objective of training programmes

Those staff members who are engaged in milking operations and come directly or indirectly into contact with milk, should be trained and/or instructed in food hygiene to a level appropriate to the operations they

are going to perform. Training is fundamentally important to any food safety system. Inadequate hygiene training, and/or instruction and supervision, of all people involved in food-related activities pose a potential threat to the safety of food and its suitability for consumption.

Awareness and responsibilities

- All personnel should be aware of their role and responsibility in protecting food from contamination or deterioration.
- Food handlers should have the necessary knowledge and skills to enable them to handle food hygienically.
- Those who handle strong cleaning chemicals or other potentially hazardous chemicals should be instructed in safe handling techniques.

Training programmes

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

- The nature of milk, in particular its ability to sustain growth of pathogenic or spoilage micro-organisms.
- The manner in which the milk is handled, including the probability of contamination.
- The conditions under which the milk will be stored.
- Hazards that may be introduced to the milk.

Instruction and supervision

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

Managers and supervisors of milk production facilities should have the necessary knowledge of food hygiene principles and practices to be able to identify and judge potential risks and take remedial action.

Refresher training

Training programmes should be routinely reviewed and updated where necessary. Systems should be in place to ensure that food handlers remain aware of all procedures necessary to maintain the safety and suitability of food. The following minimum training should be done in the milking shed:

- Personal hygiene.
- Agreement to illness report.
- Hand-washing procedures.
- Cleaning schedules.
- Handling of cleaning chemicals.
- Milking procedures.
- Milk testing (mastitis test).
- Animal health, treatment and welfare.
- Milk storage.
- Corrective actions.

Records of the training must be kept.

GOOD DAIRY FARMING PRACTICES

HYGIENE PRACTICES		
Good dairy farming practice (GFP)	Examples of suggested measures for achieving GFP	Objectives
Implement effective general hygiene practices.	<ul style="list-style-type: none"> • Compile and implement an effective cleaning and disinfectant programme for the milking shed, including the milking parlour and milk room. • Obtain work instructions from a reputable cleaning chemical supplier. • Ensure that all cleaning chemicals and disinfectants are SABS-approved. • Store cleaning chemicals in a locked facility. • Implement separate cleaning equipment for the milking parlour and milk room, and differentiate between equipment used on the floor and these used for milk equipment. • Water for cleaning and disinfection should comply with SANS 241. • Provide training in the cleaning and disinfection procedures. • Implement records. 	<p>Ensuring the effective implementation of a cleaning and disinfectant programme.</p> <p>Secure storage of chemicals and separation of cleaning equipment limit the risk of contamination.</p>
Implement effective personal hygiene practices.	<ul style="list-style-type: none"> • Implement medical screening, illness and injury reporting. • Effectively address personal behaviour and cleanliness. • Provide clean and well-maintained protective clothing to personnel. • Provide adequate change-over and ablution facilities which comply with all requirements. • Provide adequate hand-washing facilities with warm water, soap 	<p>Dairy farming practices ensure the effective implementation of personal hygiene.</p> <p>Effective personal hygiene practices limit the risk of cross-contamination.</p>
Implement an effective training programme.	<ul style="list-style-type: none"> • Provide training on personal hygiene, SOPs, animal health and treatment, handling of chemicals, milk testing, milk storage and corrective actions. • Ensure that the responsibilities of all personnel are determined and communicated. • Choose competent sources for advice and interventions. • Knowledge and awareness of charters for good dairy practice and guidelines should be promoted. • Implement records. 	<p>Knowledge of the hygiene, animal health and milking practices strengthen the implementation of the food safety system.</p>

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7. DOCUMENTATION

A food safety system is the structure used by an organisation to indicate the required responsibilities, procedures, processes and resources. Documents used in a food safety system should be kept in a controlled area and dedicated personnel shall be responsible for the keeping of master copies, distribution of copies, completion and filing of records. The basis for the food safety system is the management responsibility and commitment policy in which the owner displays the responsibility for the food safety system and the production of high-quality and safe milk.

7.1 GUIDELINES FOR THE DEVELOPMENT OF A DOCUMENTATION SYSTEM

- Identify the requirements and define whether or not a document is required.
- Write a policy/procedure/work instruction that will accurately demonstrate the needs of the organisation in meeting the requirements.
- Ensure that records are kept and maintained which will demonstrate that the requirements are being met.
- Policies must be communicated to all personnel and appropriate training must

be given to all staff members during the implementation of a procedure/work instruction.

- Personnel must sign the training records to demonstrate their commitment and awareness.

7.2 BENEFITS OF DOCUMENTATION

- A documentation system ensures that a standard working procedure is developed.
- Activities can be carried out in a structured way and the effectiveness can be evaluated and corrected.
- Documented procedures and work instructions assist in meeting legislation pertaining to the employer's liabilities.
- Documentation must reflect the day-to-day activities.
- The documentation system must be simple and efficiently controlled.
- Documents require records to prove that procedures and work instructions were performed and that corrective actions were implemented effectively.

The following are the minimum documentation and records recommended by the DSA:

DOCUMENT	REFERENCE
Management responsibility and commitment policy.	SANS 10049
Milking shed acceptability certificate as per Regulation R961.	R961
List of animals with identification numbers.	R961
TB declaration.	R961
CA declaration.	R961
Register kept of each separate milk animal's: <ul style="list-style-type: none"> • Diseases. • Each withdrawal from dairy herd. • Each return to the dairy herd for milking purposes. • Veterinary examinations done. • Veterinary treatment (antibiotics). • Name of veterinary surgeon (if applicable). 	R961

Register of vaccinations and anti-parasitic products used.	SANS 10049
Master cleaning schedule and cleaning work instructions.	SANS 10049
Safety data sheets from chemical supplier and SABS certificates.	SANS 10049
Record of water temperature during cleaning programme.	SANS 10049
Post-cleaning checklist.	SANS 10049
Records of all external maintenance done on equipment: <ul style="list-style-type: none"> • Date. • Type of repair. • Person responsible for repair. (All equipment that come into contact with milk are included, e.g. milking machine, milk tank, thermometers, etc.) Evidence of the vacuum of the milking machine being tested at least once a year by a technically competent person.	SANS 10049
Records of all internal maintenance done on equipment: <ul style="list-style-type: none"> • Date. • Type of repair. • Person responsible for repair. (Equipment may include teat cup liners.)	SANS 10049
Pest-control programme. Records of all pesticides and insecticides used, as well as date administered.	SANS 10049
Waste management programme.	SANS 10049
Records of daily milk bulk tank temperatures. Evidence that the bulk tank and ancillary equipment are capable of cooling the milk to the required temperature (4°C within 60 minutes).	SANS 10049
Records of microbiological and chemical analyses of all water that comes into contact with food contact surfaces (coliforms \leq 10 cfu/100ml, <i>E.coli</i> 0 cfu/100 ml). Two conforming test results demonstrate compliance.	R961 SANS 10049 SANS 241
Records of microbiological analyses done on raw milk (total plate count \leq 200 000 cfu/ml, coliforms \leq 20 cfu/ml, <i>E. coli</i> absent).	R1555
Records of somatic cell counts.	R1555
Records for inhibitory substances, e.g. antibiotics.	SANS 10049
Records for melamine testing.	SANS 10049
Records for aflatoxin testing.	SANS 10049
Delivery documents or stock registers of all purchased animal feed.	SANS 10049
Training schedule and records.	SANS 10049
Medical certificate for personnel working in the milking shed.	SANS 10049
Illness agreement in place. Records of illness reports and inspections done on personnel.	SANS 10049
Records of corrective actions performed on non-conformities.	SANS 10049

**AUDIT OR INSPECTION FORMAT FOR MILKING SHEDS AS RECOMMENDED BY
DAIRY STANDARD AGENCY**

Categories				
1. Documentation				
2. Milk parlour				
3. Milk room				
4. Staff				
5. Grounds				
TOTAL:				

1. DOCUMENTATION

FARM/OWNER/HERD DETAILS			
Name and registration number of farm			
Co-ordinates of farm			
District			
Name of owner			
Postal address			
Telephone/cellphone number			
Total number of animals			
Number of animals in lactation			
Total annual milk production			
Milk quota per year			
Number of workers			
On-farm production products			
Type of milking parlour			
Milking times per day			
Frequency of milk collection			
Frequency of milk sample collection			
Water source	Local authority	Borehole	Surface water
Name of attending veterinarian			
Frequency of visits			
Last two visits (dates)			
Local authority			
Name of health inspector and telephone number			
Last two visits (dates)			

	DOCUMENTS AND RECORDS	YES	NO
1	Certificate of acceptability per Regulation 961		
2	Register of animal examination every two years by veterinary surgeon		
3	Animal health certificates for TB-free animals		
4	Animal health certificates for BM-free animals		
5	Register of vaccinations		
6	Register of anti-parasitics used		
7	Register of antibiotics used		
8	Register of antibiotic withdrawal periods before rejoining the herd		
9	Records of separate milking of cows being treated with antibiotics		
10	Records of other treatments of cows		
11	Milk bulk tank room protected from insects and other pests (e.g. effective pest control programme)		
12	Register of daily milk bulk tank temperatures		
13	Milk collection on a daily/second day basis		
14	Daily milk bulk tank samples taken		
15	Udder washing		
16	Teat dipping		
17	General hygiene – cleaning schedule for premises, structure and equipment		
18	Records of maintenance programme for equipment		
19	General hygiene – cleaning schedule for equipment milking shed and milking room		
20	Records of inspections in hand-washing procedures		
21	Water source – water originates from a river/farm dam		
22	Water source – register of microbiological analysis of treated water		
23	Water source – register of chemical analysis of treated water		
24	Water source – register of daily chlorine analysis of treated water		
25	Register of total bacterial counts, coliforms and <i>E.coli</i> (one year results)		
26	Register of total somatic cell counts (one year results)		
28	Register of staff reporting illnesses and communicable diseases		
29	Records of inspections on staff members for sores, abscess on hands, necks etc.		
30	Written contract with milk buyer/processor		
31	List of animals with number identification		
32	Maintenance programme and records of equipment		

MILKING SHED INSPECTION LIST

2	MILKING PARLOUR	YES	NO	COMMENT
1	Clean and tidy (free from accumulating dung)			
2	Washable finish for doors, floors and walls			
3	External doors and windows well-fitting and weatherproof			
4	Floors are well-drained, complete and undamaged			
5	Ceilings or roof linings minimise accumulation of dirt and dust and space for vermin			
6	Adequately lit			
7	Protective coverings for lights (physical contamination)			
8	Clean and properly maintained equipment (e.g. pipelines, jars, clusters)			
9	Free as possible from dust			
10	Clear of products, chemicals and items not in use			
11	Chemicals and medicine stored separately in a locked/controlled facility			
12	Effective pest-control programme			
13	Waste bins			
14	Access to running water			
15	Access to paper towels			
16	Hand-washing facilities			
17	Hand-washing soap			
18	Not in contact with toilet, gaseous substances, etc.			
MILKING PRACTICE				
19	Teat dip/spray sanitiser (Name of product:)			
	Approved?			
20	Pulsator rate: 40-60 per minute			
21	Cleaning of milking machine			
22	Maintenance of utensils (e.g. brushes)			
23	Cleaning of utensils			

CLEANING AND DISINFECTION OF MILKING EQUIPMENT

24	Cleaning programme (temperature and time)			
25	CIP cleaning			
26	Manual cleaning of utensils			
27	Manual cleaning of bulk tank			
28	Disposal of effluent			

3	MILK ROOM	YES	NO	COMMENT
1	Clean and tidy (free from accumulated dirt)			
2	Separated from milking area			
3	Washable finish for doors, floors and walls			
4	External doors and windows well-fitting and weatherproof			
5	Windows that can open, fitted with fly screens			
6	Well-drained, complete and undamaged floors			
7	Ceilings or roof linings minimise accumulation of dirt, dust and space for vermin			
8	Adequately lit			
9	Protective coverings for lights (physical contamination)			
10	Effective pest-control programme			
11	Clean and properly maintained equipment			
12	Free as possible from dust			
13	Clear of products, chemicals and items not in use			
14	Free from foul smells			
15	Access to running water			
16	Access to paper towels			
17	Hand-washing facilities and soap			
18	Waste bins			
19	Externally cleaned bulk tank with routinely closed lid			

20	Bulk tank thermometer			
21	Well-drained concrete or similar surface collection area			
22	Well-cleaned collection area			
23	Length of pipeline from bulk tank to tanker < 6m			
24	Unobstructed access enabling safe milk collection			
25	Disposal system for effluent (pipelines/cement ditches)			
MILK COOLING EQUIPMENT				
26	Thermometer			
27	Recording of bulk milk temperature three hours after milking < 5°C			
28	Length of time stored			
29	Temperature during inspection			
30	Cooling system used:			
	<i>Plate cooler</i>			
	<i>Cooling through agitation</i>			
31	Effective agitation			
CLEANING AND DISINFECTION OF MILK COOLING EQUIPMENT				
32	Cleaning equipment stored on rack marked for floors/ inside of equipment/outside of equipment			
33	Cleaning programme (temperature and time)			
34	CIP cleaning			
35	Manual cleaning of utensils			
36	Manual cleaning of bulk tank			
37	Chemicals store in dedicated area with cups marked for dosages			
38	Disposal of effluent			

4	MILKING SHED STAFF AND STAFF FACILITIES			
1	Daily provision of clean protective clothing			
2	General hygiene (smoking, eating, coughing, etc.)			
3	Cuts and wounds covered with appropriate waterproof dressing			
4	Clean hands and arms during milking			
5	Clean and tidy			
6	Hand-washing facilities and soap			
7	Paper towels for hand drying			
8	Appropriate restroom facilities			
9	Waste bins			
10	Access to clean water			

5	GROUNDS (OUTSIDE AREA)			
1	Grass cut short, no weeds and litter			
2	Gutters clean from leaves and branches			
3	Litter and waste stored away from milking shed			
4	No stagnant water			
5	Access permitted with a fence			
6	No birds nesting on roof			
7	Engineering equipment and materials stored in orderly manner			

8. STANDARDS OF AND QUALITY CONTROL FOR RAW MILK

8.1 STANDARD FOR RAW MILK

The standard for raw milk as described in Act 54 of 1972.

REGULATION R1555 (Antibiotic Residues)

2. No person shall use or sell raw milk intended for further processing which:

(a) Contains the following:

(i) Antibiotics or other antimicrobial substances in amounts that exceed the maximum residue levels stipulated in the Regulations governing Maximum Limits for Veterinary Medicine and Stock Remedy Residues that may be present in Foodstuffs (Government Notice No. R. 1809 of 3 July 1992, as amended, hereafter referred to as the Maximum Limits for Veterinary Medicines and Stock Remedy Residues Regulations) or which by virtue of a presumptive test is suspected to contain antibiotics or other antimicrobial substances in amounts that exceed such maximum residue levels.

REGULATION R1555 (Microbiological Quality)

2. No person shall use or sell raw milk intended for further processing which:

(a) Contains the following:

(ii) Pathogenic organisms, extraneous matter or any inflammatory product or other substances which for any reason whatsoever may render the milk unfit for human consumption.

(c) Gives a standard plate count of more than 200 000 colony forming units per 1,0ml when subjected to the standard plate count test described in paragraph 7 of Annex A or the dry rehydrated film method for standard colony count described in paragraph 10 of Annex A.

REGULATION R1555 (Somatic cell counts)

(g) In the case of raw milk, on subjection to the Standard Method for Counting Somatic Cells in Bovine Milk, is found to contain an average of 500 000 or more somatic cells per 1,0ml of bovine milk or an average of 750 000 or more cells per 1,0ml of goat's or sheep's milk after three successive readings at intervals of at least seven days during the test period, or which shows any other signs of abnormal secretory activity of the mammary gland(s).

8.2 RECOMMENDED TESTS ON THE FARM

Mastitis test

Each animal should be tested for signs of mastitis before each milking. Extra care should be taken to ensure that each animal is tested properly and that all quarters are tested individually, using the California Mastitis Test (CMT). With this test a pink-coloured reagent is poured into a CMT plate with four dishes. The milker then squirts milk from each udder into a specific dish, swirls to mix the milk and reagent and observes the reaction.

Criteria for on-farm milk collection

Organoleptic (smell)	No taints or odours
Temperature	< 4°C
Alizarol	68% v/v or as required by processor
Sediment/insects	Absent
Clot on boiling test	No clot

Positive: Sample turns purple with a slime texture.

Negative: No colour change.



The mastitis cup test

With the mastitis cup test a milker will again squirt milk from each quarter into a cup with a grid. If the cow has mastitis, there will be thickened milk parts that will stick to the grid. If the grid is clean after the milk has been squirted onto it, the test is negative for mastitis.



Somatic cell counts, total bacterial counts, coliforms and *E. coli*

Total bacterial counts, coliforms and *E. coli* must be tested at least weekly and somatic cell counts monthly. Although many processors do these tests for their producers, it remains the responsibility of the producer to have these tests done. Records of these tests must be kept for inspections.

Aflatoxins, melamine and pesticides

Some processors perform these tests for their producer, but it remains the responsibility of the producer to have these tests done at least once a year.

Temperature

The temperature of the milk in the bulk tank must be recorded three hours after milking to check whether appropriate cooling has taken place, with follow-up checks every five hours until the milk is collected. On collection the tanker driver must take the temperature of the milk before it is accepted (the temperature should be $<4^{\circ}\text{C}$). The producer may request the tanker driver to enter this temperature in the milk shed records as well.

Taste and smell

Milk should look like milk, taste like milk and smell like milk with no off flavours or taints.

Ethanol stability test

Alizarol 68% or 72% (v/v) is required by the processor. The tanker driver performs this test before accepting the raw milk. The test indicates the heat stability of milk and protein stability for further processing.



Criteria for the Alizarol test

MILK	pH	% TA	FLOCCULATION	COLOUR
Fresh milk	6,60 – 6,75	0,14 – 0,16	None	Light purple
Slightly sour	6,30 – 6,50	0,17	Possible small flakes	Brownish-pink
Sour	6,00 – 6,20	0,18 – 0,19	Small flakes	Brownish-yellow
Very sour	<6,00	0,20+	Big/large flakes	Yellow
Sweet coagulation	6,60 – 6,75	0,14 – 0,16	Big/large flakes	Light purple
Mastitis	6,80 +	NA	Small flakes	Violet
Added alkaline	6,80 +	NA	None	Violet

Milk Testing

**Reducing the risk of antibiotic drug-residues and other contaminants.
The risk of dumping milk is real. Reduce it with the IDEXX SNAP® test.**





- **No incubation***
- **Rugged**
- **Simple**
- **Convenient**
- **Easy to use**



Tests Available:

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- Sulfamerizoxine
- Melampro
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1. POSSIBLE PROBLEM AREAS REFERRING TO MICRO-ORGANISMS IN RAW MILK

*cfu = colony forming units

ANALYSES

Petrifilm



Violet red bile MUG agar

ORGANISM

Escherichia coli (*E. coli*):

This organism is an indicator organism of faecal contamination due to poor hygienic practices as well as poor milking practices. It is also a pathogen that may cause illnesses and may not be present in the milk according to regulations.

E. coli means there is human or animal faeces in the milk.

- Faecal contamination from dairy animals.
- Poor hygienic practices (poor hand-washing practices – human faeces).
- Poor milking practices.
- Poor water quality.
- Poor hygiene during collection of milk.

SOURCE OR REASON

Petrifilm



Standard plate count agar

Total plate count (TPC) or standard plate count (SPC):

This is a basic quality test that is a measure of the total number of bacteria in the milk. It reveals general sanitation and herd health conditions.

Legislation: $\leq 200\,000$ *cfu/ml for raw milk intended for further processing.
 $\leq 50\,000$ cfu/ml for raw milk intended for final consumption.

- Improper cleaning and disinfection of milking equipment.
- Lack of maintenance on milking equipment.
- Improper cooling of the milk (bulk tank and during transportation).
- Improper udder preparation.
- Poor animal health.
- Poor water quality.

SOURCE OR REASON

ORGANISM

Coliforms:

This procedure is a more specific bacterial test for the quality of the milk. It is an indicator of proper sanitation. High counts can be caused by poor herd hygiene, improperly washed and maintained equipment, or a contaminated water supply.

Legislation: ≤ 20 cfu/ml raw milk for final consumption.

Salmonella:

There is a widespread occurrence of the organism in animals, especially in poultry and swine. Environmental sources of the organism include water, soil, insects, factory surfaces, animal faeces and raw animal products.

Salmonella may cause salmonellosis in consumers. Although the illness is commonly referred to as food poisoning, the resulting gastro-enteritis is an infection of the small intestine with no involvement of pre-formed toxins.

Legislation: absent in raw milk for final consumption.

Staphylococcus aureus:

Certain staphylococci produce enterotoxins, which may cause food poisoning at numbers exceeding 106/ml milk or dairy product. This ability to produce enterotoxins is usually limited to these strains that are coagulase-positive. *S. aureus* is also a major causative agent of mastitis.

Legislation: absent in raw milk for final consumption.



S. aureus on Baird Parker agar

- Poor personal hygiene (contamination from nose excretions, boils).
- Poor health status of herd (mastitis caused by *S. aureus*).
- Poor hygiene practices.
- Poor udder health/preparation (cross-contamination between cows).
- Poor milking practices.

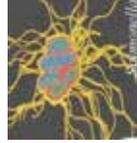
SOURCE OR REASON

- Indicator organism of poor hygienic practices.
- Poor hygiene practices of milkers (poor hand-washing practices).
- Improper cleaning and disinfection of milking equipment.
- Improper cleaning and disinfection of bulk tank.
- Poor udder preparation.
- Poor water quality.
- Absence of or improper cooling of milk (bulk tank and during transportation).
- Sub-standard cleaning chemicals used for cleaning.

SOURCE OR REASON

- People, birds and animals (faecal contamination).
- Contaminated plant material.
- Poor health status of herds.
- Poor personal hygiene.
- Poor hygienic practices.
- Poor milking practices.
- Poor water quality (borehole/untreated water used in cleaning equipment).

Various methods for pathogens





Listeria monocytogenes:

This is a bacterium common to the environment that is capable of causing serious human disease. Listeriosis is the general name given to a variety of illnesses caused by *L. monocytogenes*. Certain individuals are at higher risk of serious illness, e.g. pregnant women (cause of miscarriages), toddlers, the elderly and people with weakened immune systems.

Legislation: absent in raw milk for final consumption.

- Contaminated plant material, feed.
- Poor environmental status – organism present in the air.
- Poor hygienic practices.
- Poor milking practices.
- Poor water quality (e.g. borehole/untreated water for washing equipment).
- Stagnant water.

2. ANTIBIOTICS OR INHIBITORY SUBSTANCES IN RAW MILK

Various methods are used to determine the presence of antibiotics or inhibitory substances in milk, e.g. DeIvoTest, Charm, Rosa, BetaStar, Copan Milk Test. These substances enter milk mostly through animal therapeutic substances/treatments.

Legislation: Amounts not exceeding the Maximum Limits for Veterinary Medicine and Stock Remedy Residues Regulations.

ORIGIN/CAUSE

A. RAW MILK

Milk from treated animals enters bulk tank before end of withdrawal time:

- No permanent written records of treatments.
- Forgetting animal was treated.
- Poor identification of treated animals.
- Poor communication between person who treated and person who milks animals.
- All milk from all quarters of treated animal not kept out of bulk tank.
- Milk line used as a vacuum source to milk treated animal when using trap bucket to withhold milk.
- Separate milker unit for treated animals not used.
- Milker unit not cleaned properly between treated and untreated animals.
- Dry and treated animals not separated from the milking herd.

Prolonged drug withdrawal time because antibiotics used in extra-label fashion:

- Antibiotic drugs used at a higher dosage and/or more frequently than label instructions.
- Administering of other livestock medicines.
- Administered by a route different from label recommendations.
- Use of antibiotic drugs that are not approved for use in lactating dairy cattle.
- Feeding medicated feeds.

Animals' udders treated with antibiotic ointments, dips and sprays.

SOLUTION

- The primary producer (farmer) has to be informed of the problem.

On the farm:

- Keep a permanent record of all treatments.
- Mark all treated animals in an easily recognised manner.
- Post-treatment information on a message or bulletin board to ensure people milking are aware of treated animals and appropriate withdrawals.
- Discard milk from all quarters of treated animals.
- Check with equipment supplier whether present pulsator can be adapted to provide vacuum to trap bucket.
- Milk treated animals last or with separate equipment to ensure no contaminated milk can enter the milk supply.
- Thoroughly clean milker unit between treated and untreated animals.
- Use antibiotic test where appropriate.
- Separate dry cows from the milking herd.

- Make a permanent record of all medicines, use only approved livestock medicines, and use only according to label instructions or according to a veterinarian's prescription.
- Use appropriate antibiotic tests.
- Medicated feeds for non-lactating dairy cattle should be stored separately from the milking herd feeds.

- Use only approved products.
- Follow recommended withdrawal times.

3. OFF-FLAVOURS IN RAW MILK

Sensory evaluation is sometimes used to determine the acceptability of the milk. The following can be used as guidelines to determine the possible source of the off-flavours.

TYPE OF OFF-FLAVOUR	ORIGIN/CAUSE	SOLUTION
Malty/sour	<p>Bacterial action because of:</p> <ul style="list-style-type: none"> • Poor cooling. • Unclean milking equipment. 	<ul style="list-style-type: none"> • Cool milk down quickly to <math>-5^{\circ}\text{C}</math> (first milking is especially critical). • Keep all milking and cooling equipment clean and sanitised. • Replace old rubber parts.
Oxidised	<p>Oxidation of milk fat:</p> <ul style="list-style-type: none"> • Water used for cleaning that is high in iron, copper or sulphur (>0.1 ppm). • Excessive use of chlorine sanitisers or equipment that was inadequately drained. • Milk was exposed to sunlight and/or artificial light. • Unclean milk contact surfaces. • Excessive air incorporation, agitation and foaming. 	<ul style="list-style-type: none"> • Change water source or treat the water if necessary. • Do not exceed 200ppm chlorine in the sanitising solution. • Ensure proper drainage of equipment. • Store and transport milk away from direct sunlight/artificial light. • Ensure an effective cleaning and sanitising programme for milk contact surfaces. • Adjust speed of bulk tank stirrer, repair air leaks of inlet valves on pipelines and milk pumps, avoid oversize air inlets on milking claws, check that milk is not being pumped excessively from receiver jar.
Rancid	<ul style="list-style-type: none"> • Slow cooling. • Milk freezing in the cooler. • Excessive air incorporation, agitation and foaming. • Large number of stale animals (e.g. over 300 days in milk). • Ration low in protein. 	<ul style="list-style-type: none"> • Check cooling time of bulk tank – avoid milk freezing in the bulk tank. • Adjust bulk tank paddle (if possible) to reduce speed. • Repair air leaks of inlet valves on pipeline, receiver jar and milk pump. • Avoid oversize air inlets on milking claws. • Check that milk is not being pumped excessively from receiver jar. • Dry off stale animals. • Balance ration for adequate protein.
Unclean, barny, cowy, mouldy	<ul style="list-style-type: none"> • Poorly ventilated sheds. • Dirty cattle and/or sheds. • Coliform, mould or yeast contamination. • Unclean milking equipment. • Poor milking practices. • Cattle feed is musty or mouldy. 	<ul style="list-style-type: none"> • Ventilate barn properly. • Keep stables clean, including calf pens and maternity/sick pens, but do not clean them out while milking. • Keep cattle clean and clipped, especially flanks and udders. • Keep all equipment clean and well maintained. • Do not feed dusty/mouldy feeds.
Bitter	<ul style="list-style-type: none"> • Weeds, rancidity. • Old ensiled feeds (e.g. old silage/haylage at the bottom of silos). 	<ul style="list-style-type: none"> • Keep feed as weed-free as possible. • Do not feed old ensiled feeds to the milking herd.

4. ABNORMAL FREEZING POINTS IN RAW MILK

The freezing point is determined using a cryoscope and a lactometer can be used to check the solids. The adulteration of milk with water is not allowed by legislation. This may negatively influence the quality of the milk or dairy product.

ORIGIN/CAUSE	SOLUTION
<p>Additional water in raw milk due to:</p> <ul style="list-style-type: none"> • The deliberate addition of extraneous water to milk. • Negative or inadequate pipeline slope. • Incomplete draining of milking equipment (receiver jars, milk hoses, claws, meters, wash manifolds, letter cup assemblies etc.) before milking. • Incomplete drainage of bulk tank. • Inadvertent addition of water by "chasing" or "sweeping through" with water at end of milking. • Water pipeline connected to bulk tank during wash cycle. • Careless dipping of clusters between milking of cows. • Accidental onset of automatic cleaning-in-place system before the bulk tank is emptied or the pipeline is diverted. • Poor milking practices. 	<ul style="list-style-type: none"> • Address problem with primary producer (farmer). • Adjust pipeline to a positive slope. • Check all equipment before milking to ensure all water has drained out. • Check that the bulk tank is fully drained before closing end-valve. • Remove pipeline from bulk tank before rinsing. • Install safety switch to ensure that CIP starts after bulk tank is emptied. • Review post-milking practices.

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9. GUIDELINES FOR DAIRY EXPORT APPLICATIONS

The export of milk and other dairy products can be a long and difficult journey if the necessary procedures and protocols are not followed. The competent authority dealing with certification of dairy export facilities is the Directorate: Animal Health of the Department of Agriculture, Forestry and Fisheries (DAFF), supported by the provincial veterinary authorities.

These guidelines aim to assist those dairy producers who wish to apply for dairy export certification, by providing information paths indicating the correct procedures and relevant role players.

The export of milk and other dairy products, whether to non-EU or EU countries, is subject to compliance with the following veterinary procedural notices (VPNs):

- VPN/20/2010-01 – applies to establishments wishing to be registered for export.
- VPN/30/2003-10 – applies to farms wishing to be registered for export of dairy products to the EU.

The following notes are extracts from VPN/20/2010-10 and reflect on some of the important aspects applicants need to adhere to.

9.1 REGISTRATION PROCEDURES

Firstly, registration must be done in writing by the applicant on the prescribed application form. A detailed plan that includes the structures and process flow must accompany the application and must be signed by the official veterinarian. If the dairy establishment does not comply with the requirements upon inspection, the veterinary official must provide the applicant with a detailed report setting out the reasons why the establishment

cannot be approved.

Once the deficiencies have been rectified, a copy of the application and all supporting documents must be forwarded to the Director: Animal Health, upon which the Directorate will issue an original certificate to the applicant. Registration is only valid for one year, after which the dairy establishment must be reregistered. Review of registration is, however, applicable to cases where there have been changes in ownership or physical address. A list of all veterinary-approved dairy export establishments is regularly updated by the department and an updated list is kept by the Directorate: Animal Health.

In order to avoid deregistration, it is important that applications for re-registration reach the office of the Directorate: Animal Health before the registration certificate expires. For export to the European Union, the export establishment must complete a specific application. This is due to the fact that South Africa must be approved for export to the EU, in order for individual establishments to be approved and recommended for export. When products are exported via a storage facility in a province other than the one where the supplying establishment is located, a certificate of origin must be obtained from veterinary services. If a health certificate of origin was not issued, the state veterinarian at the storage/final export facility may not sign the export certification.

A vet-approved establishment

Applications to register a dairy export establishment are categorised as follows:

- Export of pasteurised dairy products to countries where the requirements can be

- met, with the exclusion of the EU.
- Exports to the EU
- Export of raw milk.

9.2 MINIMUM REQUIREMENTS

The minimum requirements comprise, amongst others, the following:

Management requirements

- Correct completion of all registration documents as well as availability of a valid certificate of acceptability issued by the local environmental health department (municipal health authority).
- Acceptable hygiene and a food safety management system of which the relevant South African National Standards (SANS 10049) are the norm.

Structural requirements

This relates to aspects such as access control, maintenance of grounds and premises, ablution and staff facilities, processing equipment, separation of raw and processed products, cold storage, storage and packaging, and dispatch of the final product.

Hygiene, housekeeping and sanitation

These requirements involve protective clothing, cleaning and disinfection of structures and equipment, personal hygiene, waste removal, pest control, water quality, etc.

Records

Comprehensive standard operating procedures and records are pre-requisites to ensure proof of:

- Effective cleaning and sanitation.
- Product traceability and recall.
- Control over all incoming raw materials including milk as legislated.
- Production and process control.

- Supporting documents confirming production and process control, safety of products and cold chain maintenance must be available for inspection by any veterinary official.

Laboratory practices

- Microbiological and chemical testing of raw, in-process and final products must be done as prescribed in the VPAN.
- Corrective actions must be implemented and recorded for all products which do not comply with product specifications.
- Records of tests conducted must be kept for at least six months.

Training

Initial and on-going training of personnel must provide for induction, hygiene and technical training in important aspects, milking procedures, milking and cooling equipment, animal health, cleaning schedules, maintenance of equipment and pest control. Training records must be kept.

Condition of equipment

Equipment must be in good working order, clean, well-maintained and must be regularly monitored. Equipment includes the milking machine, bulk tank and thermometers used. Calibration and verification of thermometers is necessary to ensure accurate measurement during cooling of the milk.

Farms supplying milk

The owner/manager of the dairy export establishment must provide a list of all farms supplying milk to it. All farms on the list must comply with the minimum requirements stipulated below and must be audited by the inspecting veterinary official. The official may check the details of every supplying farm or, if the list of supplying farms is extensive, a representative sample of the farms may be audited.

Milk shed approval

- All farms must have a valid certificate of acceptability from the local health authority in terms of Regulation R961.
- Veterinary officials may accept a certificate of acceptability as proof that a milking shed complies with R961 and do not have to visit all farms supplying milk to the export facility.
- Should a veterinary official visit a milking shed and find that the facility does not meet the requirements of R961, in spite of having a valid certificate of acceptability, the veterinary official may insist that the farm be excluded from the list of farms supplying milk to the export facility.
- In the case of export approval to the EU, the requirements for the farm of origin differ significantly and farms must comply with the requirements of VPN/30/2003-10 or its latest version.

Tuberculosis and brucellosis status

- Proof must be supplied of regular TB and CA testing on all farms supplying milk to the export facility.
- Testing for TB and CA can be performed by either a private veterinarian or a state veterinarian. However, declarations that a facility is TB- or CA-free, must be issued by the state veterinarian.
- In the case of TB, the farm must be tested every second year.
- In respect of CA, negative herd status can be declared on ten consecutive milk ring tests or annual blood tests.
- If there are animals testing positive for TB or CA, the decision whether to include or exclude the farm from the list of farms supplying the export facility, will depend on the nature of further processing done at the export facility. However, milk from individual TB or CA positive animals must be completely excluded from the export chain.

- If the establishment exports pasteurised milk, TB or CA positive farms do not have to be excluded from the list. Farms testing positive should receive follow-up visits by the provincial veterinary services in terms of the *Animal Disease Act* regulations.
- In the case of establishments exporting raw milk, only farms that are declared TB and CA free may be included on the list of supplying farms.
- If positive reactions are found during testing at collection points, this should be followed up by the provincial veterinary services in terms of the *Animal Diseases Act* regulations.

Records

The following records from each farm of origin must be checked by the owner of the establishment to ensure that the requirements of R961 and R1555 are adhered to:

- The temperature of raw milk in the bulk tank must be below 5°C. This must be checked upon collection on the farm and records must be provided to the export facility upon arrival of the milk (R961).
- Somatic cell count tests must be conducted regularly (R1555).
- Samples collected must be traceable so that results can be linked to a specific farm (R961).
- The alizarol test must be done on individual samples before accepting milk into the tanker (R961).

For more information, refer to the following legislation:

- **Regulation R961:** Regulation on Milking Sheds and Transport of Milk, in terms of the *Foodstuffs, Cosmetics and Disinfectants Act, 1972*.
- **Regulation 1555:** Regulation in terms of the *Foodstuffs, Cosmetics and Disinfectants Act, 1972*.

1: FARMER'S INITIATIVE

The farmer contacts the liaison officer at the processing plant if he wishes to produce milk for the export market



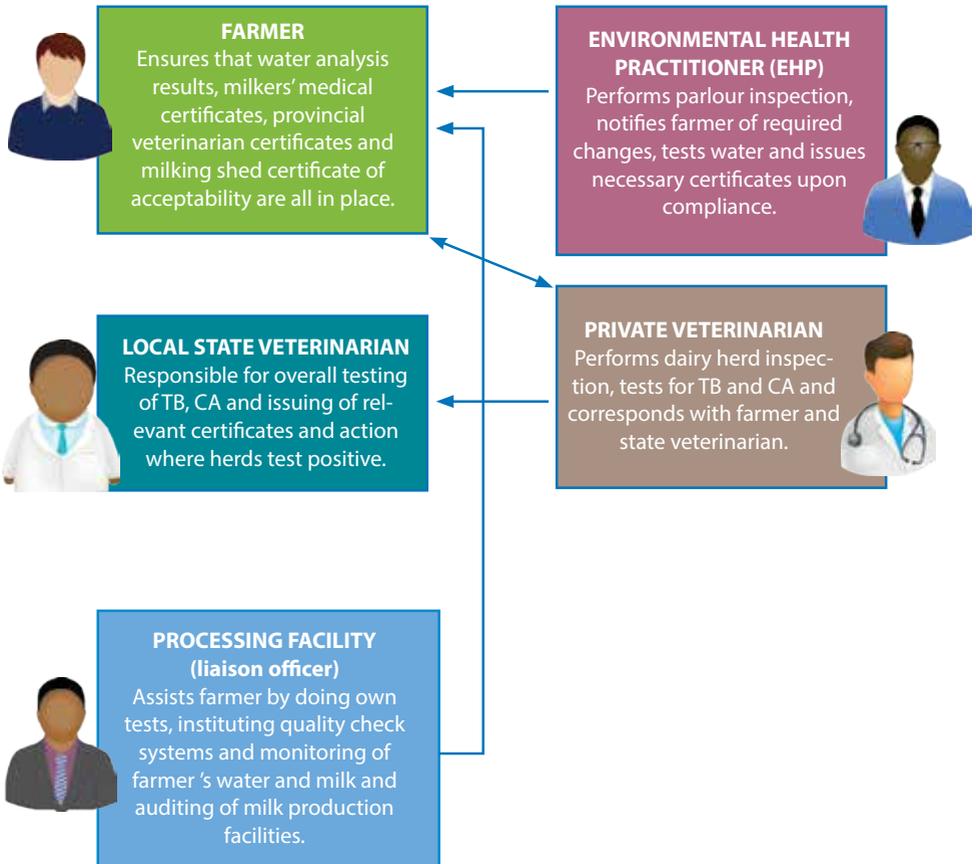
Farmer (applicant)



**Liaison officer
(represents processor) at
processing facility**



2 (a): OVERVIEW OF RESPONSIBILITIES



Our vision is to promote a healthy South African dairy community.

The primary and secondary industry sectors of the South African dairy industry are united in Milk South Africa, as the Milk Producers' Organization and the SA Milk Processors' Organization are members and as they pursue common goals and challenges through Milk South Africa.

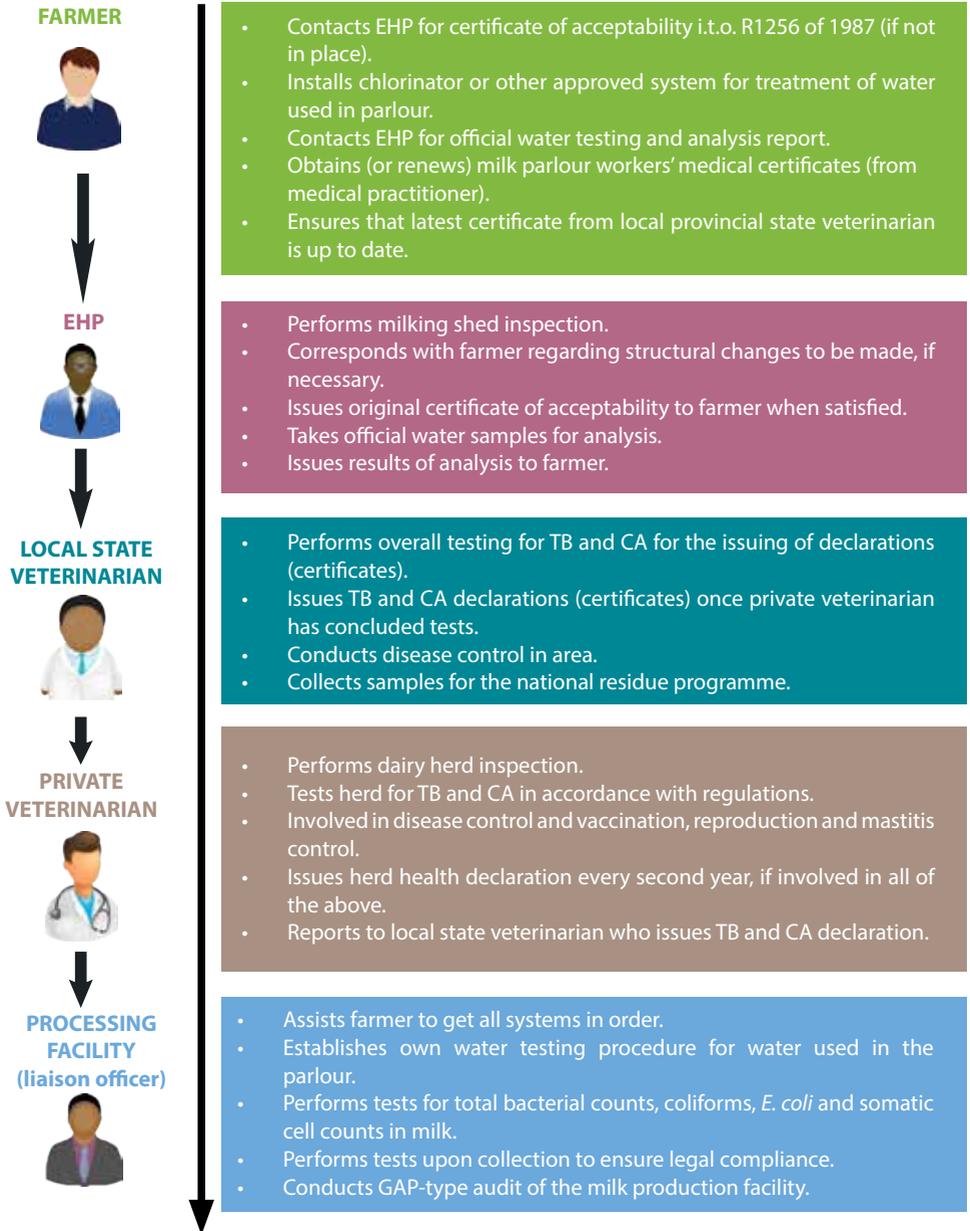
For the past ten years already, Milk South Africa has been adding value to the South African dairy industry through the promotion of the image and consumption of South African dairy products and the development of our dairy industry through value-added services such as to ...

- Educate the consumer about the nutrition and health benefits of dairy
- Improve the quality and safety of dairy products
- Publish reliable statistical and other information

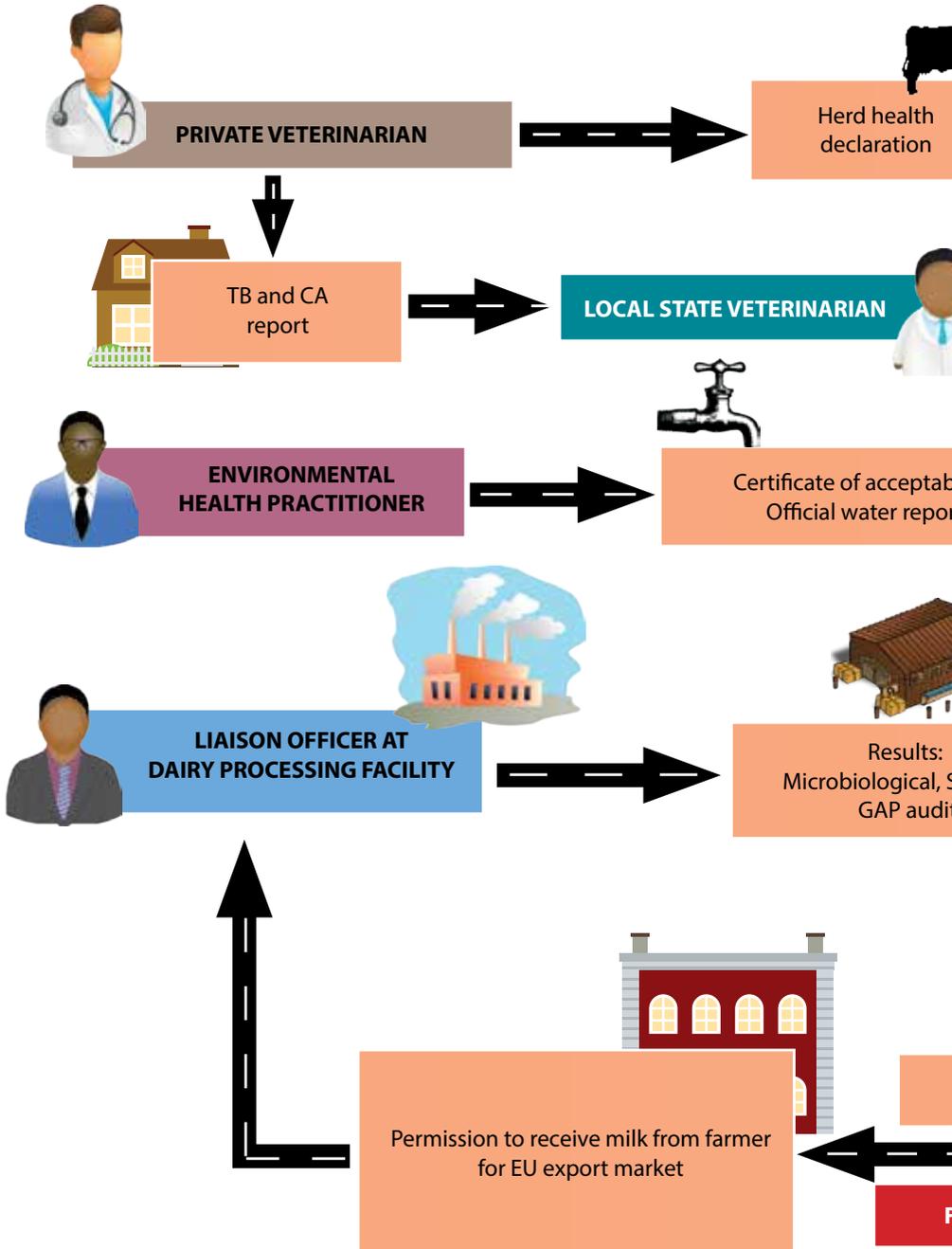


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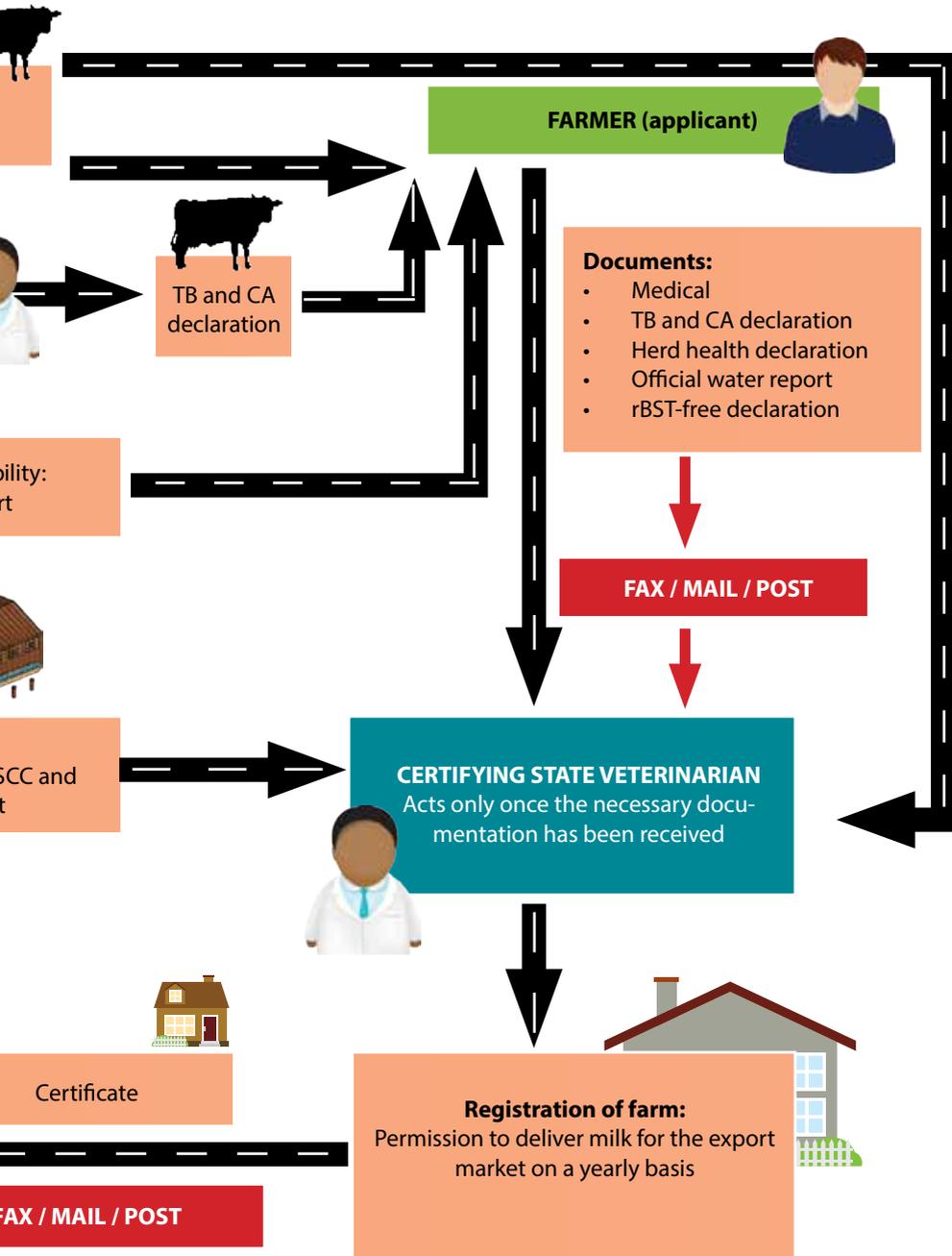
2 (b): DETAILS OF RESPONSIBILITIES



3: THE ROAD TO ACHIEVING EXP



EXPORT CERTIFICATION FOR A MILKING SHED



Wat doen die MPO?

Die Melkprodusente-organisasie (MPO) verteenwoordig en bemagtig melkprodusente deur 'n verskeidenheid innoverende dienste aan en namens melkprodusente te lewer.

Die MPO fokus op vyf strategiese kernfunksies:

- Markbeskerming en -ontwikkeling
- Kommunikasie
- Tegnologie-oordrag
- Inligting
- Beskerming van ledebelange.

What does the MPO do?

The Milk Producers' Organisation (MPO) represents and empowers milk producers by rendering a variety of innovative services to and on behalf of milk producers.

The MPO focuses on five strategic core functions:

- Market protection and promotion
- Communication
- Technology transfer
- Information
- Protection of member interests.

P O Box / Posbus 1284,
Pretoria 0001
Tel 012 843 5600
E-mail / E-pos info@mpo.co.za

www.mpo.co.za



MELKPRODUSENTE-ORGANISASIE
MILK PRODUCERS' ORGANISATION

4: SYNOPSIS OF DOCUMENTATION AND PROCEDURES REQUIRED FOR MILKING SHED CERTIFICATION

DOCUMENT	YES	NO
Milking shed – certificate of acceptability		
List of animals with number identification		
Valid TB certificate of herd health		
Valid CA certificate of herd health		
Register for every milk animal with:		
- records of diseases		
- withdrawal period from milking herd		
- reintroduction of animal to the milking herd		
- examinations by veterinarian		
- veterinary treatments (antibiotics)		
- name of veterinary surgeon (where applicable)		
Register of vaccinations		
Register van anti-parasitic products in use		
Safety data sheets of cleaning chemicals from supplier		
Records of internal and external maintenance done on equipment e.g. milking machine (teat liners), bulk milk tank and thermometers.		
Pest control programme. Records of all pesticides and insecticides as well as dates of treatment		
Weekly register / records of bulk milk tank temperatures		
General hygiene / cleaning records of the facility, structures and equipment (milking machine and bulk milk tank)		
Records of microbiological and chemical quality of water used in the milking shed (bore-hole, river, canal and or municipal water)		
Records of microbial analysis performed on raw milk (total plate count, coliforms and <i>E. coli</i>)		
Records of somatic cell counts		
Records of inhibitory tests done e.g. antibiotics, cleaning chemicals		
Records of corrective actions on non- conformances e.g. antibiotics in milk, water in milk, water quality and somatic cell counts		
Records of delivery notes or register of all purchased feeds		
Medical certificates for staff working in the milking shed		
Records of illness agreement and records of treatment of staff		
Records of inspections on staff regarding sores, abscesses on hands, neck ect.		
Written contract with milk buyer/ processor		

sampro

SOUTH AFRICAN MILK PROCESSORS' ORGANISATION

The voluntary organisation of milk processors and manufacturers of other dairy products to promote the development of the secondary dairy industry to the benefit of the dairy industry, the consumer and the South African society.

- Setting the trend on how to deal, in a deregulated environment, with collective issues in full compliance with the Competition Act
- Dynamic
- Professional
- Adhering to defined values
- Successfully managing projects regarding issues such as:
 - comprehensive and objective reporting on market conditions to promote the effective working of markets
 - regulations regarding dairy products
 - consumer education
 - dairy technical training
 - international trade issues
 - consultation with government departments and institutions
 - liaison with media and interest groups.
- Successes have been acknowledged by local and international awards.
- Active Member of Milk SA, Dairy Standard Agency and other South African and international organisations and forums.

ENQUIRIES

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gel
lyte+

Die gerieflike oplossing wat
Glutamien bevat



Die rehidrerende elektroliet jel

- + Kan met melk gemeng word wat verseker dat voeding nie onderbreuk word nie.
- + Bevat 'n bikarbonaat voorloper om metaboliese asidose te behandel.
- + Bevat Glutamien
- + Is pienk van kleur sodat die voedingsbakke waarin dit gebruik is maklik identifiseerbaar is.
- + Maklik om te gebruik; bevat 'n doseringskoppie en is ekonomies aangesien elke bottel tot 20 liter (10 doserings) van die oplossing maak.

BIOTECH
LABORATORIES (PTY) LTD
VETERINARY

Norbrook



Suppliers of:

- **Fruit juice concentrates**
 - 100% fruit juice concentrates
 - Fruit nectar concentrates
 - Dairy fruit blend concentrates
- **Yoghurt and drink yoghurt ingredients**
 - Fruit preparations
 - Syrup preparations
 - Stabilisers
 - Cultures
 - Preservatives
 - Liquid sugar solutions
- **Cheese ingredients**
 - Annatto
 - Cheese coating and cheese wax
 - Cultures
- **Dairy-specific packaging materials**
 - Milk and juice bottles (250ml-5 litres)
 - Yoghurt cups (plain, printed and IML) (80g-1kg)
 - Foil lids (71mm & 95mm)
 - Buckets (5-25 litres)
 - Drinking cups

Other services offered:

- Equipment consulting and supply
- Recipe development
- New product development



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The Scours 'Most Wanted' List



NEW ScourGuard®

Your **TRUSTED PROTECTION** in Prevention of Scours ... just got better.

ScourGuard® 4KC is for vaccination of healthy, pregnant cows and heifers as an aid in preventing diarrhoea in their calves caused by bovine Rotavirus (serotypes G6 + G10), bovine Coronavirus, enterotoxigenic strains of *Escherichia coli* having the K 99 pill adherence factor and *Clostridium perfringens* type C.



Delivering maximized protection proven by challenge-of-immunity studies in:

- Rotavirus G10 • Rotavirus G6
- Coronavirus • *E.coli* K99

Protecting Your Dairy Herd



Fertility is Fragile

Don't Let Infection Compromise it



Common dairy cattle infections such as foot rot, respiratory disease and clinical metritis pose a great risk to healthy fertility

Protect your herd from the dangers of infection with the broad-spectrum (including Gram - anaerobes) injectable antibiotic. By protecting cattle health, it helps ensure consistent fertility. This supports regular calving, leading to a proven higher milk yield. This ready-to-use formula is also the anti-infective with zero milk withdrawal.



For more information, speak to your veterinarian.



FIGHT INFECTION TO PROTECT FERTILITY

LECTADE®

Treatment of scours, through prevention and reversal of dehydration and loss of electrolytes and energy.

- Reduces scour duration and therapy.
- Replaces lost fluid and electrolytes.



Bloat Guard® Drench

Bloat Guard® is used to treat frothy bloat in cattle.

Signs of bloat IN CATTLE:

- Distended left abdomen, no longer grazing
- A reluctance to move & staggering
- Appear distressed – vocalise, eyes bulging;
- Strain to urinate and defecate
- Rapid breathing – mouth may be open with tongue protruding

Your veterinary rescue remedy for the treatment of cattle that show signs and symptoms of Bloat.



Reference: 1. Data on file. Study Report No. 2134H-60-02-010, Pfizer Inc.; Study Report No. 3131 R-60-03-289, Pfizer Inc.; Study Report No. 3131 R-60-04-347, Pfizer Inc.; Study Report No. 3131 R-60-04-361, Pfizer Inc.; No. 3437R-60-03-315, Pfizer Inc.; Study Report No. 3437R-60-03-316, Pfizer Inc.; Study Report No. 3437R-60-03-317, Pfizer Inc.; Study Report No. 2134H-60-02-002, Pfizer Inc.

ScourGuard®, Reg. No. G5841 (Act36/1947). Composition: Inactivated bovine rotavirus(G6 + G10) and coronavirus propagated on established cell lines, a K99 E. coli bacterin on *C. perfringens* type C toxoid. Lectade®, Registration No. G361 (Act 36/1947). Composition: Each treatment consists of sachet A (Glycine 31.8% m/m, electrolytes & citric acid 68.2% m/m) & Sachet B (Dextrose 100% m/m).

Bloat Guard® Drench, Reg. No. G1026 (Act 36/1947). Composition: 25 g Pepsol per 30 ml.

Zoetis South Africa (Pty) Ltd Reg No: 2012/001825/07, P O Box 783720, Sandton, 2146, South Africa. Website: www.zoetis.co.za



Dairy Standard Agency

Tel: 012 665 4260

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www.dairystandard.co.za