CHAPTER 4
PACKAGING AND TRACEABILITY

Chapter 4: Packaging and Traceability

1. Introduction

Dairy products are packaged to:

- Enable efficient food distribution.
- Maintain product hygiene.
- Protect nutrients and flavour.
- Reduce food spoilage and waste.
- Increase food availability.
- Convey product information.

2. Legislation and food containers

R 962
R 2581
R 1555

Food containers or packaging must not be damaged, must be leak-free and free from any substances that can spoil and contaminate the food product. The packaging must be fit for the purpose and able to protect the product.

The law requires that packaging be such that a seal must be broken to access the contents.

SANS 10049, 8.9
SANS ISO 22000, 7.3.3
SANS 1678, 10
SANS 1679, 10
CGCSA FSI GMCP B.A 1.1, I.A.7.1, I.A 6.1

It is important to ensure that full specifications are in place for all types of packaging material. Packaging material must not taint food or degrade when in contact with the product.

3. General requirements

SANS 10049, 7.3.1
SANS ISO TS 22002-1, 8.4
SANS 1678, 5.7, 5.8
SANS 1679, 5.7, 5.8
CGCSA FSI GMCP B.A. 1.1, IA 7.1

Packaging equipment requires special attention to minimise contamination of products after the required heat treatment or manufacturing process. The equipment should therefore not allow any contamination to either the product or the packaging.

SANS 10049, 8.3,
SANS ISO TS 22002-1, 8.4
SANS 1678, 10
SANS 1679, 10
CGCSA FSI GMCP I.A.8

The purpose of packaging material is to ensure that milk or dairy products reach the consumer in a condition safe for consumption. The manufacture of packaging materials requires the same general hygiene requirements that apply to dairy plants. Processors of dairy products must ensure procurement of packaging material from reputable manufacturers only. Such facilities must be available for inspections and good manufacturing

practices should be in place. The transportation of the packaging materials from the manufacturer to the processor is important and delivery vehicles must be inspected on receipt. Damaged material should be returned to the supplier.

SANS 10049, 7.5
SANS ISO TS 22002-1, 13
SANS 1678, 5.13, 6.6
SANS 1679, 5.13, 6.6
CGCSA FSI GMCP B.B 1

The personal hygiene of workers handling packaging material should be a priority:

- Hands are the most obvious source of pathogenic bacteria.
- Staff members handling packaging material must adhere to the personal hygiene code of conduct of the processing facility. They should be encouraged to wash their hands at frequent intervals during the course of their work.
- A sanitiser rub (alcohol-based) in the packaging area is highly recommended. This should only be used AFTER proper hand washing and not as a replacement.
- A special training programme must be implemented for staff members explaining that they must not touch the inside of containers.

4. Packaging materials

4.1 General requirement

SANS 10049, 8.9
SANS ISO TS 22000
SANS 1678, 10
SANS 1679, 10
CGCSA FSI GMCP B.A.1.1, I.A.7

Products are packaged to prevent biological, chemical, and physical contamination and to enhance shelf life. The packing process, therefore, should not be a source of contamination.

Packaging material should be compatible with:

- Product characteristics.
- Storage conditions.
- Storage conditions up to final use.

As different dairy products have different characteristics, e.g. butter versus milk, packaging specialists should be consulted for the correct selection of materials.

SANS 10049, 8.9
SANS ISO 22000
SANS 1678, 5.9
SANS 1679, 5.9
CGCSA FSI GMCP B.A.1.1, I.A.7

The packaging material in direct contact with the product must be manufactured with raw materials suitable for contact with the food and consequently:

- Should not transfer any colour, odour or taste to the end product.
- Should not modify organoleptic characteristics of the product during storage.
- Should not release substances in amounts higher than permitted.
- Should be prepared in accordance with basic production hygiene.
- Should render the protection required by the particular food product.

Furthermore, packaging material should be chosen and used considering the following:

- Where requested, and for correct storage, packaging should show the conditions and the temperature of storage.
- It is advisable that labels contain directions for correct storage and use of the product.
- Disposable plastic packaging material must be produced hygienically and should be stored to prevent contamination.

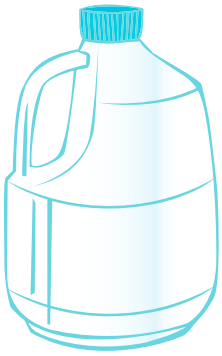
4.2 Glass containers

Glass containers should be designed and constructed so as to permit easy and complete cleaning and sanitising before re-use.

Containers that are damaged or not perfectly sound should be discarded.

Correct cleaning and sanitisation may include:

- Identification and elimination of foreign matter.
- Pre-washing with warm water at suitable temperature.
- Soaking in warm alkaline solution.
- Repeated washing in the same alkaline solution.
- Thorough rinsing in potable water or in water rendered potable.
- Disinfection, followed by final rinsing.



4.3 Plastic containers

The material used for these containers should be heat-resistant if used for warm filling or if heat-treated after filling. Containers should be resistant to thermal shocks during filling to avoid deforming, breaking and cracking, which could affect the shelf life of the product.

4.4 Aseptic packaging of sterilised products

Aseptic packaging requires that:

- All parts of the equipment in direct contact with the sterile product, after the heat treatment and before filling, are sterile.
- The packaging material is sterilised during its use.
- All possible precautions are taken to avoid recontamination and to ensure a hermetic container.

Depending on composition, packaging material can be sterilised by chemical, physical or physical/chemical agents. Such methods should be used ensuring:

- Treatment efficacy.
- Safety of the product.
- Safety of the people operating the process.

4.5 Microbiological quality of packaging material

In the quality control programme of the factory, the laboratory should ensure the microbiological quality of the packaging equipment.

In such a programme the factory sets its own microbiological standards for packaged products, procedures and processes. It also sets microbiological limits and acceptability criteria for the packaging materials and control methods.

CGCSA FSI GMCP B.B 4.1

Cardboard or outer case packaging should not enter the final packaging areas. ONLY PACKAGING MATERIALS THAT ARE USED WITHIN A DAY'S OPERATION MAY BE KEPT IN THE PROCESS PACKAGING AREA (DAY STORE).

4.6 Labelling requirements

R 146
R 2582
SANS 289
SANS 10049, 4, 8, 9
SANS 10049, 4, 8.9

Pre-printed packaging must conform to all legal labelling requirements.

Typical nutritional information (as packed/ready-to-eat).

	Per 100 g/ml	Per single serving
Energy (kJ)		
Protein (g)		
Glycaemic Carbohydrate (g) of which total sugar (g)		
Total fat (g)		
of which Saturated fat (g)		
*		
**		
**		
***		
Dietary fibre# (g)		
Total Sodium (mg)		
Any other nutrient or food component to be declared in accordance with these Regulations. In alphabetical order, in the order: vitamins, minerals, others.	Indicated in grams (g), milligrams (mg), micrograms (mcg/µg), or appropriate unit of measurement	Indicated in grams (g), milligrams (mg), micrograms (mcg/µg), or appropriate unit of measurement

Quantified single serving size expressed in grams or millilitres, whatever is appropriate.

Place the statements required by Regulation 50(4) as appropriate here.

* place to insert trans fat
** place for a subgroup nutrient, such as monounsaturated fat, polyunsaturated fat, omega-3 fatty acids et cetera
*** place to insert cholesterol when cholesterol information is given
# Indicate method of analysis used to determine dietary fiber

5 Storage of packaging materials

5.1 General

SANS 10049, 7.2.11.3,
SANS ISO TS 22002-1, 5.7
SANS 1678, 5.9.3, 6.7.5
SANS 1679, 5.9.3, 6.7.5
CGCSA FSI GMCP I.B.4.1-4.3

Packaging material must be stored in a clean and hygienic environment to ensure that it is not contaminated prior to usage.

The area used for storage of packaging materials should be dedicated. The construction of the stores must ensure that it is dust- and rodent-proof. The stores should be large enough to allow for a passage way around the walls to preclude the establishment of breeding sites for rodents and to enable effective cleaning.

Lights should be covered in the area to avoid the destruction of packaging in the event of glass breaking.

SANS 10049, 7.2.6
SANS ISO TS 22002-1, 6.6
SANS 1678, 5.5
SANS 1679, 5.5
CGCSA FSI GMCP B.B 2.3

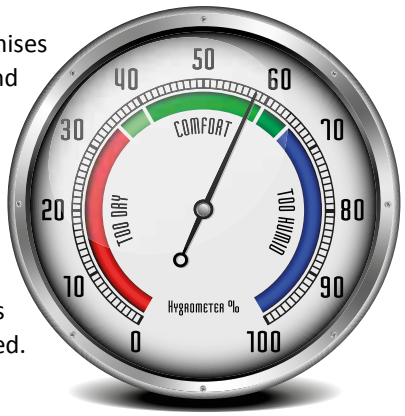
The following basic handling guidelines should be followed:

- Packaging materials must be inspected on delivery to ensure that there is no evidence of damage or insect infestation.
- Packaging material must be stored completely separate from other materials such as detergents, milk powders, essences, lubricants, chemicals, animal feed, etc. The outer wrapping will not protect the material from strong contaminants. There is a great risk of the packaging material absorbing these vapours, which could result in off-taste problems.
- Storage for long periods of time should be avoided.
- Packaging material must be handled with care so that it is not damaged, especially the edges of the reels, which must be protected.
- All preformed packaging must be protected by outer wrapping at all times. Cups should be inverted at all times.
- Packaging material should not be used for ANY other purpose such as for storage of detergents or lubricants.
- Each reel is shrink- or stretch-wrapped. The first portion of all plastic film reels should be discarded, if not protected by wrapping.
- Each pallet is enclosed in a shrink-wrap shroud or stretch-wrap.
- Reels are loaded on transport pallets, which are one-way units. Whilst suitable for their purpose, their strength is limited.
- Pallets can be stacked up to six metres high, provided that a rigid divider board is placed between the top of the lower pallet and the next pallet for protection.
- Reels of packaging material must not be stored directly on the floor. A wall and floor clearance of 100 to 150 mm must be maintained. Pallets provide a 100 to 150 mm floor clearance. This is for cleaning

SANS 10049, 8.5, 8.6, 8.9
SANS ISO TS 22002-1, 9.3, 10.2
SANS 1678, 5.9.3
SANS 1679, 5.9.3
CGCSA FSI GMCP I.B, 4.1-4.3

purposes. Pallet stacks should be stored with a walkway to allow for cleaning and inspection for infestation. Where shelves are used, there should still be a clearance of 0,3 m to allow for cleaning under the shelves.

- Conveyors that convey packaging to filling machines should be covered to prevent contamination. The conveyor should also be designed for easy cleaning. If the conveyors are lubricated there should be a catch tray in place.
- Any packaging material remaining in the filling machine must be protected from liquids and dust during cleaning, etc. Reels at end of production must be protected with shrink-film before being returned to storage with a reel identity. Shrink-film or other material used for protection of the packaging material can accumulate dust during the transport and storage and must be removed before bringing the packaging material into the production area.
- The temperature in the storage premises must be higher than freezing point and have a relative humidity of 30 to 70%. The optimum temperature range is between 10 and 30°C. If possible, deviation from these requirements should be corrected for optimum conditions. Under no circumstances must condensation (water) from pipes or wet conditions in general be tolerated.



SANS 10049, 8.5, 8.6, 8.9
SANS ISO TS 22002-1, 5.7
SANS 1678, 5.9.3
SANS 1679, 5.9.3
CGCSA FSI GMCP I.B, 4.1-4.3

To avoid crushing, pallets of cartons should not be stacked on top of each other. When stacking, the top layer must not make contact with structures – this would avoid pathways for insects and rodents.

SANS 10049, 8.6.10
SANS ISO T/S 22002-1, 16.2

The packaging material should be used in the same order as the material has been delivered, i.e. first-in, first-out.

5.2 Storage of aseptic packaging material

SANS ISO T/S 22002-1, 10.2

All parts of the equipment in direct contact with the sterile product, after heat treatment and before filling, are sterile; all utility media used in direct contact with the product are sterile, e.g. air, steam and water should be sterile-filtered.

The packaging material is sterilised during its use.

All possible precautions are taken to avoid recontamination and to ensure a hermetic container.

6 Packaging equipment

6.1 General requirements

SANS 10049, 7.3.1
SANS ISO TS 22002-1, 8
SANS 1678, 5.7, 5.8
SANS 1679, 5.7, 5.8
CGCSA FSI GMCP B.B 2.4

Packaging equipment should be designed and constructed in such a way as to avoid recontamination of products and packaging materials, and provide high hygienic standards during its use.

Stainless steel is the preferred material for packaging equipment. However, any material in direct contact with the products must be non-toxic and

resistant to corrosion, cleaning and disinfecting products, and repeated contact with the product itself.

In general, all parts in direct contact with food should be easy to inspect, clean and sanitised. Lubrication should be carried out in such a way that it does not compromise the integrity of the product. Only food grade lubricants should be used.

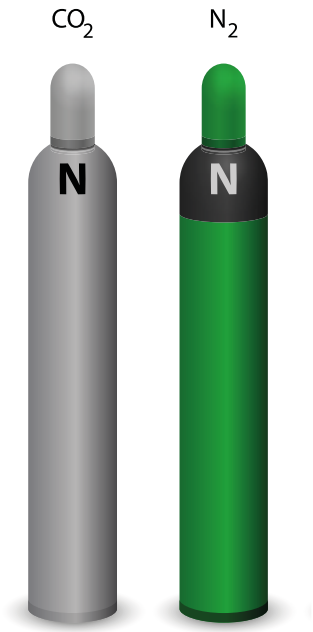
SANS 10049, 7.3.2.4
SANS ISO TS 22002-1, 8
SANS 1678, 5.7, 5.8
SANS 1679, 5.7, 5.8
CGCSA FSI GMCP B.B 2.4

Devices for inspection or sampling during packaging should be designed and used in such a way as to avoid product contamination.

6.2 Compressed air and filters

If compressed air is used for bottles that are dented and the air under pressure comes into direct contact with the product or is in direct contact with milk contact surfaces, it should be of the highest quality. Sterile compressed air can be obtained by drying the air after compression in absorption filters and by installing a series of filters with 0,2 micron pore size downstream, immediately preceding the equipment where the air is used. Compressed air which is used in direct contact with food or on food surfaces should be filtered to ensure that it is free from particles, moisture (water and oil), tastes and odours and microorganisms. Depending on the performance and the type of compressor used, a four- to five-stage filter system may be required to remove all the above-mentioned impurities. Typical applications are air used for overpressure on tanks and filling machines and air used to reform plastic bottles if dented.

SANS 10049, 7.4.3
SANS ISO TS 22002-1, 6.5
SANS 1678, 5.11
SANS 1679, 5.11



Gases, ambient or compressed (N_2 or CO_2), used in packaging under a protective atmosphere, should have purity characteristics appropriate for food contact. According to the law they should be sterile-filtered with a 0,2 micron sterile air filter at the point of use if in direct contact with the product.

SANS 10049, 7.4.3
SANS ISO TS 22002-1, 6.5
SANS 1678, 5.11
SANS 1679, 5.11

6.3 Crates

Crate washing areas should be physically separated from the processing and packaging areas. Staff working at the crate washing area (dirty area) must not enter the packing area. The crate washing area must be included in the master cleaning schedule.

Dirty crates are not allowed in packaging areas.

Disinfectants and cleaning chemicals (detergents) must be used at the recommended dosages. Crates used for the packaging of sachets must have new plastic liners.

7. Traceability of milk

7.1 General requirements

SANS 10049, 8.9, 8.11
SANS ISO 22000, 7.9
SANS 1678, 10.1
SANS 1679, 10.1
CGCSA FSI GMCP B.A.2

Product identification and traceability ensures that the product in the market can be traced to the manufacturer, back to the raw materials used to manufacture it and to identify how much of that product was manufactured. This information is essential in the event of a product recall. The company should adequately identify all raw materials and be able to trace work-in-progress and finished products at all stages during manufacture, storage, dispatch and, where appropriate, distribution to the customer.

7.2 Traceability of raw milk

Farm to fork/cow to consumer

FARM

- **COW**
- **BULK COOLING**
- **TRANSPORTATION**

FOR EVERY MILK SUPPLIER/FARMER

- Sample raw milk from every bulk tank as reference sample to the processing facility.
- Sample properly marked to identify supplier.
- Samples kept refrigerated to processing facility.

PROCESSING & MANUFACTURING

- Samples analysed/milk received or rejected.
- Samples kept as reference samples .
- Records of which milk in which silo/holding tank.
- Corrective actions if problems are identified.
- Batch identification on packaging material, sell by/best by date of production/time etc.
- Retention samples/shelf life.
- First in first out (FIFO) system with codes on pallets.
- Identification of products delivered to different stores (invoice/packing slip/delivery note).

FINAL PRODUCT

- **RETAILER**
- **CONSUMER**

- Delivery note/invoice etc. to specific store.
- Goods received note.
- Products with batch identification.
- Recall procedure (use batch codes to identify products from processor to retailer and visa versa).
- Batch identification (size and product identification) used for customer complaints.

7.3 Traceability of other raw materials

The following raw materials may be used in production:

- Packaging materials.
- Flavourings.
- Colourants.
- Juice concentrates.
- Dry ingredients such as stabilisers, milk powder and sugar.

Each of these may have an impact on the product quality and safety.

When goods are received at the factory store, the following should be checked and recorded:

R 146
SANS 10049, 8.3, 8.5
SANS 258
SANS ISO TS 22002-1, 9.3
CGCSA FSI GMCP I.A.6.1

- Inspection for pest infestation.
- Product identification/batch codes.
- Product specifications.
- Certificate of analysis (COA).
- Supply product with a date or code for first-in, first-out system (FIFO).
- Integrity checks.
- Labelling requirements.

It is imperative that the processing facility has a robust quality assurance programme to ensure that suppliers have effective food safety and quality systems in place.

SANS 10049, 8.3
SANS ISO TS 22002-1, 9.2
CGCSA FSI GMCP I.A.7

A list of all ingredients used in production with batch codes to trace the ingredient back to the raw material and to suppliers, must be available for all products manufactured.

SANS 10049, 8.8, 8.11
SANS ISO 22000, 7.9
SANS 1678, 10.2
SANS 1679, 10.2
CGCSA FSI GMCP B.A.2

8 Withdrawal of products/recall

Food business operators should ensure that adequate procedures are in place to withdraw food products from the market where such food products present a serious risk to the health of consumers:

SANS 10049, 9.3
SANS ISO TS 22002-1, 15
SANS ISO 22000, 7.10.4
CGCSA FSI GMCP B.A.3, I.A.4

a. Procedures include the persons responsible.
b. Roles and responsibilities for the coordination of the withdrawal.
c. Methods to identify, locate and control withdrawn products.
d. Requirements to investigate other possibly affected products which could subsequently be included in the withdrawal.
e. Disposal of affected products in the correct manner.

A formalised programme for evaluating consumer/customer complaints, particularly those related to adulteration, should be established. This programme should conform to company policy and should include the rapid dissemination of complaint information to all departments responsible for implementing the food safety programme.

Actions appropriate to the seriousness and frequency of the problems identified should be carried out promptly and effectively.

SANS 10049, 10.1
SANS ISO 22000, 7.10
CGCSA FSI GMCP I.A.4

All customer complaints should be thoroughly investigated and effective corrective action taken to avoid the recurrence.

SANS 10049, 9.3
SANS ISO TS 22002-1, 15
SANS ISO 22000, 7.10.4
CGCSA FSI GMCP B.A.3

A formal recall programme should be written and kept on file for all products being manufactured. The recall programme should be regularly reviewed, and if necessary, revised to ensure it is current. All products should be coded and lot or batch number records should be maintained. Distribution records should be maintained to identify the initial point of distribution to facilitate segregation and recall of specific lots.

The recall programme should be tested annually and the test should be documented as part of the recall programme and product traceability.

9 Rework

SANS 10049, 9.1, 9.2
SANS ISO TS 22002-1, 14
CGCSA FSI GMCP B.A.4

It is inevitable that there will be a small percentage of products that are damaged but these may be reworked. The management of rework is critical to ensure that the product is not compromised for the sake of a small cost.

For example, sachets and bottles that leak or are under-filled must be placed in dedicated marked containers (drums) and it is recommended that such milk be used for cultured milk production or used as stated in the rework policy. This policy should involve evaluation for suitability before rework. Records of the inclusion rate of the rework must be kept.

SANS ISO TS 22002-1, 14
CGCSA FSI GMCP B.A.4

Where any reworking operation is performed, traceability shall be maintained and procedures should be implemented to ensure the safety, legality and quality of the finished product.

SANS 10049, 9.1, 9.2
SANS ISO TS 22002-1, 14
CGCSA FSI GMCP B.A.2
See Documentation Development Programme on DVD

A written policy for rework should be implemented and should include the following:

- Product to be reworked.
- Reason for rework.
- Inclusion rate of rework into other products.
- Batch identification.

10 Non-conforming, work-in-progress, finished or returned product

SANS 10049, 9.1, 9.2
SANS ISO 22000, 7.10
CGCSA FSI GMCP B.A.4

Clear procedures for the control of non-conforming work-in-progress, finished or returned products should be in place and understood by all authorised personnel. These procedures should include disposition by rejection, acceptance with restrictions, or consideration for an alternative use.

SANS 10049, 10.1
SANS ISO 22000, 7.10
CGCSA FSI GMCP B.A.5

Corrective actions taken should be proportionate to the seriousness of risks identified.

- Adequate documentation should be kept of all actions taken. All nonconforming products should be handled or disposed of according to the nature of the problem and/or the specific requirements of the customer.
- Disposition of non-conforming material should be tracked to ensure that inventories are adjusted accordingly to facilitate recall.
- Damaged or destroyed materials should be recorded and proper adjustments to the product inventory records should be made to accurately account for the damaged or destroyed materials.

R 1555

! Note that by law NO returns from the trade may be reworked or processed for sale!

IMPORTANT LINKS

HACCP
Remember to refer back to Chapter 1 to recap on the hazards identified and preventive measures in the handling of raw milk and the DVD

DOCUMENTATION
Remember to refer back to Chapter 12 and the DVD for more details on the suggested documentation required for raw milk handling