No. 928 **25 September 2009**

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with Regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Food

registered by Organising Field 06 – Manufacturing, Engineering and Technology, publishes the following Qualification and Unit Standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification and Unit Standards. The full Qualification and Unit Standards can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the Qualification and Unit Standards should reach SAQA at the address below and ***no later than 26 October 2009.*** All correspondence should be marked **Standards Setting – SGB for Food** and addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Milk and Cream Handling and Storing

SAQA QUAL ID	***QUALIFICATION TITLE***		
74229	National Certificate: Milk and Cream Handling and Storing		
ORIGINATOR		***PROVIDER***	
SGB Food			
QUALIFICATION TYPE	***FIELD***	***SUBFIELD***	
National Certificate	6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABET BAND	***MINIMUM CREDITS***	***NQF LEVEL***	***QUAL CLASS***
Undefined	125	Level 2	Regular-Unit Stds Based

This qualification replaces:

Qual ID	Qualification Title	NQF Level	Min Credits	Replacement Status
50083	National Certificate: Milk and Cream Handling and Storing	Level 2	120	Will occur as soon as 74229 is registered

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

The purpose of this qualification is to ensure that the person who receives bulk milk or cream at a dairy reception facility can monitor the acceptability of bulk raw milk or cream and receive it into the processing system, thereby contributing to the quality assurance of dairy products. Bulk raw milk or cream is the main raw material for all dairy products. It is therefore of the utmost importance that this bulk milk or cream is of good quality to ensure that final products are also of good quality and are safe for human consumption. This qualification provides the backbone to any career opportunities within the dairy manufacturing environment.

A person acquiring this qualification will be able to take samples of bulk milk or cream at a dairy reception facility and determine the quality of the raw milk or cream. By evaluating the results of the determinations, he/she will be able to determine whether the milk or cream is suitable for intake. On acceptance, he/she will be able to receive, store and maintain the raw milk or cream for processing and manufacturing of dairy or dairy containing products. Portable competencies such as cleaning and sanitising of the reception system will also be obtained. The person will be able to apply all relevant personal safety and food safety practices during the performance of his/her tasks.

This qualification will allow a person to have access to education, training and career paths within the dairy industry, ensuring learning mobility and progression on the framework through articulation with other qualifications. This qualification will enhance the social, economic and personal development of the learner, as well as the sustainability and productivity of the dairy industry. The qualification will accelerate the redress of past unfair discrimination in education, training and employment opportunities.

Rationale:

This qualification reflects the workplace-based needs of the dairy industry that is expressed by employers and employees, both now and for the future. Typical learners will be new entrants to the dairy manufacturing industry, or persons who are currently working in a raw milk or cream handling and storing environment who have not received any formal recognition for their skills and knowledge.

This qualification is a reviewed and updated version of the similar qualification developed by the dairy industry in 1990 as a result of the demand in the dairy industry for national recognition for milk or cream reception personnel, being the backbone of the dairy industry. This former qualification in milk reception was registered with Department of Labour from 1990-1998, where after it was registered on the NQF as an integral part of the interim registered dairy qualifications on Level 4. The first version of the unit standards based National Certificate in Milk and Cream Handling and Storing NQF Level 2 was registered on the NQF in 2001 and this qualification serves as the revised version thereof.

This qualification aims at providing formal recognition for competencies already obtained and will continue to do so by providing recognition for workers in the dairy industry, specifically milk or cream reception. In addition, this qualification provides the new entrant with the opportunity to obtain competencies in milk and cream reception within the workplace. In this way, value is added to workers` employability and competence and the sustainability of the dairy industry is improved.

This qualification provides the learner with competencies to be employed within the dairy industry, but also gives the learner the flexibility to pursue different careers in the dairy sector, as well as in other food industries. The range of electives will allow the individual to pursue a career within a milk reception, laboratory, quality assurance and dairy manufacturing environment. Skilled workers are one of the key players in better manufacturing standards and productivity, which may increase business prosperity. This qualification will assist in social and economic transformation.

The secondary focus of the qualification is on food safety and personal safety and therefore this qualification will contribute to the establishment of workplace competencies that will ensure safe working practices and food products that are healthy and safe for human consumption.

RECOGNIZE PREVIOUS LEARNING?
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LEARNING ASSUMED IN PLACE
- Communication, Physical Science and Mathematical Literacy at NQF Level 1.

Recognition of Prior Learning:

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience.

Access to the Qualification:

Open access.

QUALIFICATION RULES
- All fundamental unit standards are compulsory; 36 credits.
- All core unit standards are compulsory; 64 credits.
- A minimum of 25 credits should be chosen from the elective component.
- A total of 125 is required to obtain this qualification.

EXIT LEVEL OUTCOMES

Qualifying learners can:

1. Maintain and apply good manufacturing practices in a raw milk or cream handling and storing environment.

2. Receive and store raw milk or cream in a silo at a milk reception facility.

3. Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Critical Cross-Field Outcomes:

Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made by:

- Problem solving during milk or cream reception and laboratory analysis.

Evident in the following Exit Level Outcomes:

- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Work effectively with others as a member of a team, group, organisation or community by:

- Applying team-work during cleaning and sanitising, milk or cream reception and laboratory analysis.
- Co-ordinating one`s work with that of others in the direct surrounding area.

Evident in the following Exit Level Outcomes:

- Maintain and apply good manufacturing practices in a raw milk or cream handling and storing environment.
- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Organise and manage oneself and one`s activities responsibly and effectively by:

- Planning one`s activities.

Evident in the following Exit Level Outcomes:

- Maintain and apply good manufacturing practices in a raw milk or cream handling and storing environment.
- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Collect, analyse, organise and critically evaluate information by:

- Taking samples.
- Keeping records of milk or cream reception and sample analysis.
- Analysing samples and evaluating the results.

Evident in the following Exit Level Outcomes:

- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations by:

- Keeping records and noting results.

Evident in the following Exit Level Outcomes:

- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Use science and technology effectively and critically, showing responsibility towards the environment and health of others by:

- Working according to health and safety regulations.

Evident in Exit Level Outcomes:

- Maintain and apply good manufacturing practices in a raw milk or cream handling and storing environment.
- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation by:

- Problem solving during milk or cream reception and laboratory analysis.

Evident in the following Exit Level Outcomes:

- Maintain and apply good manufacturing practices in a raw milk or cream handling and storing environment.
- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

Contribute to the full personal development of each learner and the social and economic development of the society at large by:

- Applying good manufacturing practices during raw milk or cream reception.
- Receiving and storing raw milk or cream.
- Analysing raw milk or cream.

Evident in the following Exit Level Outcomes:

- Maintain and apply good manufacturing practices in a raw milk or cream handling and storing environment.
- Receive and store raw milk or cream in a silo at a milk reception facility.
- Analyse and evaluate the quality of raw milk or cream for intake at milk reception.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

- Knowledge and comprehension regarding personal safety practices in a raw milk and cream handling and storing environment are applied according to standard operating procedures and safety requirements.

• Personal health, hygiene and presentation in a dairy processing environment are maintained according to the Occupational Health and Safety Act.
• Knowledge and comprehension of the effect of micro-organisms on personal health, hygiene and dairy product safety are applied according to standard dairy microbiology principles.
• Milk or cream reception equipment and surfaces are cleaned and sanitised manually and according to standard operating procedures.
• An understanding of the application of good manufacturing practices in a food safety system is demonstrated according to standard food safety principles.

Associated Assessment Criteria for Exit Level Outcome 2:

• Knowledge and comprehension of dairy terminology, equipment and systems are applied according to standard dairy principles.
• Knowledge and comprehension of heating and cooling media in a milk reception facility are applied according to standard dairy principles.
• Knowledge and comprehension of the nature of milk and its transformation into commercial dairy products are applied according to standard dairy principles.
• Raw milk or cream is received and stored in a silo at a milk reception facility according to standard operating procedures.
• A dairy reception facility is cleaned and sanitised using an automated cleaning in-place system and according to standard operating procedures.

Associated Assessment Criteria for Exit Level Outcome 3:

• A milk or cream sample is taken according to standard operating procedures.
• Food laboratory safety is maintained according to standard laboratory procedures.
• The quality of raw milk is analysed and evaluated in terms of its protein stability as indicated by the alizarol test.
• The quality of raw milk is analysed and evaluated in terms of its antibiotics content.
• The quality of a dairy product is analysed and evaluated in terms of its fat content, as indicated by the Gerber or Babcock fat determination method.
• The quality of a food product is analysed and evaluated in terms of its pH.
• The temperature of raw milk or cream is analysed and evaluated according to quality control procedures.

Integrated Assessment:

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a learner is able to evaluate the quality of raw milk or cream and receive, store and maintain raw milk or cream for processing and manufacturing of dairy or dairy containing products.

The identifying and solving of problems, team work, organising one-self, the using of applied science, the implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies demonstrated. Assessment methods and tools must be designed to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) must be used to establish the foundational, reflexive and embedded knowledge applied to solve problems.

A detailed portfolio of evidence is required to prove the practical, applied and foundational competencies of the learner.

Assessors should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods and should assess combinations of

practical, applied, foundational and reflexive competencies. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.

The receiving and storing of milk or cream, representative sample taking, cleaning and sanitising and quality assuring the raw milk or cream by means of laboratory tests can be assessed in one application.

Unit standards in the qualification must be used to assess specific and Critical Cross-Field Outcomes.

INTERNATIONAL COMPARABILITY

The following leading dairy producing countries all support and implement vocational training and education, but not on a structured qualifications framework as found in South Africa:

- Germany.
- France.
- Netherlands.
- Switzerland.
- Denmark.
- Sweden.
- United States of America.

With regards to vocational training and education, most of these countries implement decentralised and market-orientated programmes, both in technical and commercial training.

In Europe in general, the Society of Dairy Technology (SDT) in the United Kingdom in conjunction with the European Dairy Technology Diploma Holders Association (AEDIL) and the Dairy Industry Association (DIAL) worked together to formulate a pan-European initiative to issue Vocational Education Passports giving details of the holder's qualifications and experience in the dairy field. This was designed to assist both employers and employees. In Europe, it facilitates the movement of labour from one country to another, which is of increasing importance as dairy companies consolidate.

In Germany, for instance, although no information could be found about specific vocational training towards milk and cream handling and storing similar to this South African qualification, a very pertinent vocational training system is implemented. When leaving schools, 70% of German students take a course of vocational training, mostly within their so-called "dual system". This system combines practical, on-the-job training with theoretical instruction at a part-time vocational school. Through their close cooperation, private business, industry and the public sector are sharing responsibility: Training regulations are drawn at federal level, while the states oversee the vocational schools. There are three types of vocational schools in Germany:

Part-time vocational schools (Berufsschulen):

- In the dual system, the vocational schools complement the training received in a company. Trainees attend a part-time vocational school one or two days a week for three years. The schools teach general subjects and theories that are easier understood in the classroom than at work. Usually about 40% of the school work is in basic academic subjects such as languages, mathematics and sciences and about 60% in subjects directly related to the chosen profession. Performance is assessed in an exam and documented by a certificate issued mostly by the chamber of industry and commerce.

The full-time vocational school (Berufsfachschule):

• This school offers courses lasting one to three years. These can be part of an apprenticeship or even replace an apprenticeship entirely.

The vocationally oriented upper secondary school (Fachoberschule):

• This school admits students with an intermediate school certificate. Courses cover theoretical instruction as well as training workshops and on-the-job training. They generally last two years and qualify participants for the specialised college (Fachhochshule).

On-the-job training (apprenticeships), last between two and three and a half years, depending on the complexity of the occupation. During this period, the apprentice earns a training allowance. The professional requirements that have to be learned during the vocational training are spelled out in training regulations. Based on proposals from the business associations and trade unions, these regulations are regularly revised and updated. The training concludes with an examination conducted by a board of examiners, generally organised by the local chamber of industry and commerce. On the board of examiners are representatives of employers as well as vocational school teachers.

Although no company is obliged to provide training, over 500 000 firms in all branches of the economy, including the independent professions and the public service, provide vocational training. Larger enterprises have their own training workshops, but smaller firms train their apprentices right on the job. Very specialised firms pool their resources and send their apprentices to inter-company training centres in order to broaden their vocational skills.

The above system therefore compares well with the NQF based education and training system of our country.

Higher education towards Dairy Technology in Germany is presented at state of the art universities, for instance the Technical University of Munich. These courses, however, focus mainly on high level food process engineering and dairy research and development, other than the focus of this South African qualification.

The West part of France, with 50% of the national milk collection and 10% of the European milk production is the first French dairy area and one of the largest in Europe. The European Centre for Dairy Research and Training (ECDaiRT or CEREL) is a stakeholder that plays a major role in training in development in the dairy sector of France. It was established in 2001 and is a network of public research teams consisting of research staff and technical staff. By integrating and structuring the research sector, the extension services, the industry, the education and the public information in a multidisciplinary approach (from the herds and the farms to the dairy processing industries and the consumers), CEREL has the following emphasising aims:

• Developing new strategies of milk production and milk processing.
• Knowledge and scientific support.
• Education and training programmes tailored to disseminate knowledge ad expertise towards milk producers and processing industries.

CEREL brings together all the actors involved in the milk and dairy chain of the West of France, namely:

• Institute of National Research in Agriculture (INRA).
• Ecole Nationale Supérieure Agrinomique de Rennes (ENSAR).
• Ecole Nationale Supérieure Agrinomique de Toulouse (ENSAT).
• Centre National du Machinisme Agricole, du Génie Rural, des Eaux et des Forêts (CEMAGREF).
• Institut de l'Elevage.
• ITG Ouest.

- University of Renne, specialising in Ultrafiltration and Nanofiltration training.
- Centre National Interprofessionnel de l'Economie Laitière (CNIEL).
- Regional Chamber of Agriculture in Britain.
- British Biotechnology Alumni (BBA).

No specific dairy training programmes in France could be found at the time when this international comparability study was conducted.

In the Netherlands, dairy training courses from PTCplus were found. PTCplus is an international training centre in Netherlands which focuses on high-quality training in the field of agriculture, dairy technology and dairy production. Only the third one of the following four courses compared well with this South African qualification, although not unit standards based:

Module on Production of Dairy Products:

- A two week short course for managers, production managers, staff, consultants, trainers government officials involved in small-to medium-scale dairy enterprises. The course covers the production of liquid milk products such as pasteurised milk, yoghurts, whey drinks, yoghurt drinks, as well as butter, fresh-, soft-, medium-hard and hard-cheese. It does not include the manufacturing of evaporated milk, sweetened condensed milk and milk powders, but this can be arranged on request.

International Diploma in Dairy Husbandry and Milk Processing:

- A 26 week course for persons who contribute through teaching, training, extension and/or management activities directly or indirectly to the development of the dairy sector. The course covers training and extension, dairy farm management and small-scale milk processing.

International Training Programme on Milk Processing:

- A two, four or six week course, depending on the modules chosen. This course is intended for managers, staff of training institutes, staff of advisory services and future staff of new dairy enterprises. It covers milk procurement, production of dairy products and business administration, marketing and quality management. Each module can be attended as a "stand-alone". This course compares well with the South African Dairy qualifications, since it covers the following:
  - Milk Procurement (Composition and characteristics of milk, milking systems and storage of milk on the farm, milk collection, transport and reception, storage of raw milk at the plant, quality control tests on raw milk, payment of raw milk, cleaning and sanitising, yoghurt production).
  - Production of Dairy Products (Pasteurised milk, yoghurts, whey drinks, yoghurt drinks, butter and cheese). It does not include the manufacturing of evaporated milk, sweetened condensed milk and milk powders, but this can be arranged on request. The programme may be adapted to the specific needs of the participants.
  - Business Administration, Marketing and Quality Management (Financial administration of a dairy plant, marketing plans, quality management systems, food safety and hygiene audits, HACCP).

Module on Business Administration, Marketing and Quality Assurance:

- A two week short course for managers, quality assurance managers, marketing managers, quality assurance staff, business administration and marketing staff, consultants, trainers and lecturers active in the dairy sector. Topics cover financial administration of a dairy plant, marketing plans, quality management systems and food safety and hygiene audits.

In Switzerland, the Dairy Processing Technology Department of the Swiss College of Agriculture in Zollikofen, in collaboration with the Swiss Federal Dairy Research Station and the University

of Applied Sciences in Bern provides the following two courses, however not relating well with this South African qualification:

Food Technology, specialising in Dairy Processing:

• This course covers dairy and food processing technology, as well as dairy business and management that will prepare candidates for challenging positions in the executive level in the dairy and food industry. In applied research and development, projects are carried out in collaboration with the dairy industry and other partners such as the Swiss Federal Dairy Research Station. Post-formation courses allow professionals to keep up to date evolving knowledge.

• Cheesemaking Technology:

• A three week course in the theory and practice of cheese manufacturing, including experience sharing with the Swiss cheese industry. Topics include milk quality, cultures, coagulation, cheesemaking process, brining/salting, ripening, storage, cheese types (fresh, quark, cottage, Pasta Filata, Feta, soft, Cheddar, processed, Ricotta, analogues, cheese made from milk of other animals), UHT, ultrafiltration, microfiltration and nanofiltration. Trained cheesemaking experts facilitate the training.

Denmark offers a long line of dairy-related educations. These multi-level educations are made available by the Danish Dairy Board, Dalum Education Centre, the Royal Danish Veterinary and Agricultural University and the Technical University of Denmark.

In Denmark great importance is attached to providing vocational training with an international perspective. Therefore, young Danish students are urged and supported to carry out a trainee period abroad.

Vocational training in Denmark is organised so that practical training and theoretical training alternate. This combination of theoretical training at a vocational school and work experience in a company apply for all vocational educations in Denmark.

Skilled Dairyman and Dairy Operator:

The practical part of the education may partly take place in companies outside Denmark (EU and Norway, Iceland, Switzerland and Liechtenstein). The content and structure of the dairy educations are laid down by the professional committee in accordance with Danish legislation.

The dairy education takes 3 years-normally with 50 weeks of theoretical training and 106 weeks of practical training. It is possible to complete an education as a qualified dairy operator after 1½ years. The dairy operator education consists of 30 weeks of theoretical training and 48 weeks of practical training.

The student can be credited for any relevant education or previous occupation essentially identical to the goals of the educations as dairyman or dairy operator.

It is the aim of the dairy educations that the skilled dairyman can undertake tasks of a technical nature within the dairy field such as:

• Carry out manual and automated operative functions according to current rules and regulations.
• Carry out the work in accordance with the quality control and other control systems of the company.
• Show insight and understanding related to the environmental conditions of the working area.
• Be able to work closely together with other professions.

• Obtain qualifications to develop skills through work and in-service training.

For the skilled dairyman the aim is furthermore to combine knowledge of the technical, the microbiological, physical and chemical conditions of dairy products with planning, documentation and quality evaluation of the tasks connected to the manufacturing of dairy products.

Theoretical training:

The theoretical training consists of:

• Basics (first aid, hygiene, information technology, environmental studies, health, economy, English, physics, chemistry and mathematics)-a total of 16 weeks.
• Area studies (knowledge of the trade, dairy production, company organisation and quality consciousness, quality of production and equipment)-a total of 19 weeks.
• Special subjects (dairy technology, processing and optional special subjects)-a total of 9 weeks.
• Optional subjects-a total of 6 weeks.

Practical training:

The practical training covers the following work areas and functions:

• Reception of raw material, pasteurisation and standardisation of milk.
• Preparation of production machinery for operation.
• Operation and regulation of production equipment.
• Production and quality control.
• Working with single processes in the production-mainly tasks of handling, cleaning and transport.
• Laboratory work and administrative tasks supplementing the work in the production.

The Danish dairy company is responsible for the practical part of the education and also for the period abroad in order to make the international work experience an integrated part of the whole education.

At the end of the trainee period the mentor will be asked to fill out a summary of the work functions which the apprentice has carried out during his/her stay.

Depending on the length of the trainee period it may be necessary for the apprentice to attend a school period at Dalum Education Centre, College of Food and Technology in Denmark. During such periods the apprentice will receive his/her wages from the Danish company.

Although broader in nature, this Danish course covers most of the topics that are addressed in this South African qualification.

Danish Dairy Training Programme:

The Danish Dairy Training Programme is an offer from the Danish Dairy Board to young dairy industry employees. The training is based on a period of work in a dairy outside Denmark for 3-12 months. The training period is designed to offer experience and insight into dairy production in dairy companies outside Denmark, personal development and improved language skills. These are all valuable qualifications for a young graduate who is applying for work in Denmark or abroad.

Courses in Denmark on Higher Education level include the following:

• Dairy Engineering-Presented by the Technical University of Denmark.

• Master of Science in Dairy Technology-A two-year academic programme offered in collaboration between the Royal Veterinary and Agricultural University and the Technical University (Denmark) and Lund University (Sweden).
• Processing Technologist (Dairy Technology)-A two-year education to become a processing technologist, available from Dalum Education Centre.

A lot of the dairy training offered by Sweden is done in collaboration with Denmark. Up till 2004, Sweden did not have any programmes specifically targeting the dairy sector. A number of Swedish dairy manufacturing industries have recognised the need for training their employees, and have since started to formalise specific dairy training programmes. None of these could, however, be found at the time when this international comparability study was conducted.

Also, no specific dairy training programmes in the United States of America could be found at the time when this international comparability study was conducted.

With regards to Africa, South Africa is by far the leading dairy producing country. Evidence was found of in-house dairy training courses presented in countries like Botswana, Mozambique, Namibia, Kenya, Lesotho and Swaziland, however, these are mostly initiated and funded by South African dairy manufacturing organisations and research facilities, as well as by international stakeholders like the Food and Agriculture Organisation of the United Nations (FAO). Independent African comparable courses could not be found.

Training programmes and best practices in dairy processing and manufacturing were compared for the following leading countries, which all implement a qualifications framework system:

• New Zealand.
• Australia.
• England, Wales and Northern Ireland.
• Scotland.

At the New Zealand Qualification Authority (NZQA), one qualification exists at Level 2 for dairy processing, namely:

National Certificate in Dairy Manufacturing (Process Skills):

This is an entry-level qualification intended for new employees working under close supervision. It recognises the ability to apply on-the-job skills within defined areas of responsibility. The qualification is structured on compulsory industry generics, a limited elective selection for enterprise specifics, and a set of broader electives covering operations, service and storage roles as well as foundation knowledge in food safety and good manufacturing practices. The design is modelled on the Certificate I in Food Processing from the Australian Qualifications Framework.

Compulsory standards include the following:

• Mathematics.
• Communication.
• People skills (team work).
• Food safety and quality assurance.
• Health and safety.

Two elective strands (A or B) are possible:

Elective strand A:

• Manual packaging.

- Automated packaging.
- Mixing and blending.
- In-house distribution.

Elective strand B:

- Occupational health and safety.
- Product safety programmes.
- Manual and automated cleaning and sanitising.
- Dairy supply chain.
- Routine maintenance.

Thus, part of the New Zealand qualification compares well with this South African qualification, although the South African qualification has a much stronger focus on milk reception and product analytical skills. On the other hand, the New Zealand qualification has a stronger focus on packaging, supply chain and maintenance skills than its South African counterpart.

Other New Zealand qualifications where elements of milk reception were found include the following:

- National Certificate in Dairy Manufacturing (Process Skills) Level 3, with strands in Processing and Supply Chain (and with optional strands in Performance Improvement and Product Safety).
- National Certificate in Dairy Manufacturing (Technology) Level 3, with an optional strand in Process Improvement.

It therefore seems as if most of the New Zealand qualifications have combined the skills of milk reception, dairy primary processing, dairy laboratory analysis and dairy product manufacturing into a single qualification with the aim at specific job descriptions. On the other hand, the South African model allows for four different, much more detailed and custom-made qualifications, which focus on the required skills, rather than on the job-description.

The Australian Qualifications Framework (AQF) contains a qualification (Certificate II) in Food Processing, which consists of core, specialist and optional units. The core component focuses on mathematics, communication, food safety, occupational health and safety and quality assurance.

Dairy-related specialist units include the following:

- Cleaning and sanitising.
- Materials handling.
- Packaging.
- Preparation and mixing.
- Production and process control.
- Retail.
- Coating/Enrobing.
- Evaporation.
- Filtration.
- Heat treatment.
- Drying.
- Homogenising.
- Retorting.
- Pumping.
- Pre-processing of raw materials.
- Separation.
- Production of spreads.
- Butter churning

- Continuous freezing.
- Processing of butter oil.
- Curd production and cutting.
- Cooling and hardening.
- Cheese pressing and moulding.
- Fermentation.
- Holding and storage
- Membrane processes.
- Deodorising (butter).
- Neutralisation (butter).

The Australian Certificate III in Food Processing offers three units relating to milk reception, namely:

- Bulk liquid transfer.
- Loading and unloading tankers.
- Working with temperature controlled stock.

Clearly the above-mentioned qualifications do not focus entirely on milk and cream reception and storage, but provides a broader option on Level 2 and 3. Optional units around quality, good manufacturing practices and problem solving compares well with this South African qualification.

On the National Qualifications Framework (NQF) of England, Wales and Northern Ireland, a wide range of vocational qualifications (VQs) are accredited. These qualifications range from broad-based VQs to specialist qualifications designed for a particular sector. In partnership with the Learning and Skill Council (LSC) and the Sector Skills Development Agency (SSDA), the Qualifications and Curriculum Authority (QCA) in England has a remit to extend the take-up of VQs. In line with the more flexible school curriculum, this included their use by more 14 to 19-year olds.

National vocational qualifications (NVQs) are work-related, competence-based qualifications. They reflect the skills and knowledge needed to do a job effectively, and show that a candidate is competent in the area of work the NVQ represents. NVQs are based on national occupational standards, similar to the unit standards applied in South Africa.

In terms of NVQs, dairy processing and manufacturing technology forms part of the City and Guilds Food Manufacturing Qualifications (dairy manufacturing is one of the specialised routes), which replace the former NVQ in Food and Drink Manufacturing Operations on Levels 1-3. The structure of the qualifications will be in the form of an award (1 unit), certificate (2 units) and diploma (3 units) for both Levels 2 and 3. This will mean that employers who may not want their working candidates in college for too long will be able to offer a VQ possibly as a short course (e.g. the certificate route) which underpins the NVQ.

On Level 2 the units for the qualifications are as follows:

Mandatory:

- Principles of working in food manufacturing and workplace safety.

Optional (applicable to dairy):

- Cheese and butter production.
- Dairy science and technology.
- Fermented dairy products and ice-cream production.
- Liquid milk and dried products production.
- Food processing in manufacture.

- Nutrition and food science.
- Retail operations in food manufacture.

On Level 3 the units for the qualifications are as follows:

Mandatory:

- Principles of working in food manufacturing and monitoring food safety.

Optional (applicable to dairy):

- Cheese and butter production.
- Control of resource in food manufacture.
- Dairy science and technology.
- Fermented dairy products and ice-cream production.
- Food science and technology in manufacture.
- Liquid milk and dried products production.
- Product design and technology in food manufacture.
- Quality assurance in food manufacture.

The City and Guilds qualifications on both Levels 2 and 3 focus more or less on the same areas, although the qualifications on Level 3 provides an extra focus on monitoring and control procedures, as well as on quality assurance. Although some overlap exists between the United Kingdom and South African qualifications with regard to quality control, none of the mentioned NVQs provide access to training in milk and cream handling and storing.

The Scottish Vocational Qualifications (SVQs) provide a qualification in Food Manufacture (Production Control Skills) on Level 2. It consists of mandatory units around food safety and occupational health and safety, as well as optional units.

Dairy-related optional units include the following:

- Production specifications.
- Reporting and recording.
- Task hand-over and changeovers.
- Product control.
- Weighing, mixing and batching.
- Heat treatment.
- Separation.
- Temperature control.
- Packaging.
- Planning your activities.
- Team work.
- Quality control and quality assurance.
- Maintenance.
- Materials handling.
- Manual cleaning and cleaning-in-place (CIP).
- Continuous improvement.
- Problem solving.
- Start-up and shut-down procedures.

Clearly the Scottish qualification has a major different focus than this South African qualification.

Summary:

While focusing specifically on bulk milk and/or cream handling and storage, this South African qualification covers the generic food handling and processing competencies contained in the qualifications listed above. All mentioned countries, with their strong agricultural and dairy farming sectors can be regarded as leaders in the field. This means therefore that this qualification, because of its similarity to those mentioned above, can be regarded as of good standard, comparable with the best provided elsewhere.

ARTICULATION OPTIONS
This qualification articulates vertically with the following qualifications:

- ID 50024: National Certificate: Dairy Primary Processing, NQF Level 3.
- ID 50305: National Certificate: Food Laboratory Analysis, NQF Level 3.

The first Exit Level Outcome of this qualification provides possible horizontal articulation into other NQF Level 2 Food qualifications.

MODERATION OPTIONS
- Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor and moderator respectively with the relevant ETQA, or with another ETQA that has a Memorandum of Understanding with the relevant ETQA.

- Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA, or with another ETQA that has a Memorandum of Understanding with the relevant ETQA.

- Assessment and moderation of assessment will be overseen by the relevant ETQA, or by another ETQA that has a Memorandum of Understanding with the relevant ETQA, according to the ETQA`s policies and guidelines for assessment and moderation.

- Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes and the integrated competence described in the qualification.

- Anyone wishing to be assessed against this qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS
For an applicant to register as an assessor, the following are essential:

- Anyone assessing a learner against this qualification must be registered as an assessor with the relevant ETQA, or with another ETQA that has a Memorandum of Understanding with the relevant ETQA.

- The applicant should have a similar qualification to this one at NQF Level 3 or higher, with a minimum of 12 months field experience.

NOTES
This qualification replaces qualification 50083, "National Certificate: Milk and Cream Handling and Storing", Level 2, 120 credits.

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	119463	Access and use information from texts	Level 2	5

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	9009	Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	3
Fundamental	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3
Fundamental	9008	Identify, describe, compare, classify, explore shape and motion in 2-and 3-dimensional shapes in different contexts	Level 2	3
Fundamental	119454	Maintain and adapt oral/signed communication	Level 2	5
Fundamental	119460	Use language and communication in occupational learning programmes	Level 2	5
Fundamental	7469	Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2
Fundamental	9007	Work with a range of patterns and functions and solve problems	Level 2	5
Fundamental	119456	Write/present for a defined context	Level 2	5
Core	120410	Clean and sanitise food manufacturing equipment and surfaces manually	Level 1	4
Core	120412	Demonstrate an understanding of dairy terminology, equipment and systems	Level 1	4
Core	120404	Maintain personal hygiene, health and presentation in a food handling environment	Level 1	4
Core	120398	Measure the temperature of food products and evaluate the readings	Level 1	2
Core	120401	Take a representative food sample	Level 1	4
Core	120416	Apply personal safety practices in a food or sensitive consumer product environment	Level 2	5
Core	120405	Clean and sanitise a fast moving consumer goods (FMCG) processing system using an automated cleaning-in-place (CIP) system	Level 2	5
Core	120402	Demonstrate an understanding of introductory principles of chemistry and physics	Level 2	5
Core	120418	Evaluate the quality of milk in terms of its protein stability, as indicated by the alizarol test	Level 2	3
Core	120407	Evaluate the quality of raw milk in terms of its antibiotics content	Level 2	5
Core	120413	Receive and store raw milk or cream in a silo at a milk reception facility	Level 2	8
Core	120245	Demonstrate an understanding of the nature of milk and its transformation into commercial dairy products	Level 3	6
Core	120241	Evaluate the quality of a dairy product in terms of its fat content, as determined by the Gerber or Babcock fat determination method	Level 3	5
Core	120411	Evaluate the quality of a food product in terms of its pH	Level 3	4
Elective	116932	Operate a personal computer system	Level 1	3
Elective	117902	Use generic functions in a Graphical User Interface (GUI)-environment	Level 1	4
Elective	120403	Apply good manufacturing practices as part of a food safety system	Level 2	4
Elective	336839	Collate and shrink-wrap packaged products using automated wrapping equipment	Level 2	6
Elective	336819	Collect bulk milk from a farm by means of a milk tanker	Level 2	8
Elective	336799	Demonstrate an understanding of heating and cooling media in a food manufacturing environment	Level 2	4
Elective	120397	Evaluate the quality of a food product in terms of its titratable acidity	Level 2	4
Elective	120417	Understand the control of pests and waste materials as part of a food safety system	Level 2	3
Elective	120237	Evaluate the composition of raw milk as determined by an infra red analyser	Level 3	6
Elective	120408	Evaluate the quality of milk in terms of its freezing point	Level 3	4
Elective	120400	Evaluate the quality of milk in terms of its solids-non-fat content	Level 3	4
Elective	120395	Evaluate the quality of raw milk in terms of its microbial load, as indicated by the resazurin test	Level 3	5

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate an understanding of heating and cooling media in a food manufacturing environment

SAQA US ID	*UNIT STANDARD TITLE*		
336799	Demonstrate an understanding of heating and cooling media in a food manufacturing environment		
ORIGINATOR		*PROVIDER*	
SGB Food			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	4

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
120242	Demonstrate an understanding of heating and cooling media in a food-manufacturing environment	Level 2	4	Will occur as soon as 336799 is registered

SPECIFIC OUTCOME 1
Demonstrate an understanding of the concept of energy.

SPECIFIC OUTCOME 2
Demonstrate an understanding of the generation and application of steam as a heating medium.

SPECIFIC OUTCOME 3
Demonstrate an understanding of the application of water and gases as cooling media.

SPECIFIC OUTCOME 4
Demonstrate an understanding of the generation and application of electricity as an energy source for heating and cooling purposes.

SPECIFIC OUTCOME 5
Demonstrate an understanding of the safe handling of heating and cooling media, as well as electricity.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	74229	National Certificate: Milk and Cream Handling and Storing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Collect bulk milk from a farm by means of a milk tanker

SAQA US ID	*UNIT STANDARD TITLE*		
336819	Collect bulk milk from a farm by means of a milk tanker		
ORIGINATOR		*PROVIDER*	
SGB Food			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	8

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
120396	Collect bulk milk from the farm by means of a milk tanker	Level 2	8	Will occur as soon as 336819 is registered

SPECIFIC OUTCOME 1
Demonstrate an understanding of bulk milk collection from a farm.

SPECIFIC OUTCOME 2
Prepare for bulk milk collection.

SPECIFIC OUTCOME 3
Transfer bulk milk from a tank to a milk tanker.

SPECIFIC OUTCOME 4
Perform end of collection duties.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	74229	National Certificate: Milk and Cream Handling and Storing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Collate and shrink-wrap packaged products using automated wrapping equipment

SAQA US ID	*UNIT STANDARD TITLE*		
336839	Collate and shrink-wrap packaged products using automated wrapping equipment		
ORIGINATOR		*PROVIDER*	
SGB Food			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	6

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
120238	Collate and shrink-wrap packaged products using automated wrapping equipment	Level 2	6	Will occur as soon as 336839 is registered

SPECIFIC OUTCOME 1
Demonstrate an understanding of collating and shrink-wrapping.

SPECIFIC OUTCOME 2
Prepare to collate and shrink-wrap packaged products.

SPECIFIC OUTCOME 3
Collate and shrink-wrap packaged products.

SPECIFIC OUTCOME 4
Perform end of shrink-wrapping procedures.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	74229	National Certificate: Milk and Cream Handling and Storing	Level 2