

Transformation

2014/15 Handbook

for the South African Dairy Industry



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AN INITIATIVE OF MILK SOUTH AFRICA (NPC)



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- The organisations that shared their information and photographs with us, so that this manual could, in addition to its practical value, also be colourfully presented
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FOREWORD

Milk SA, its two members (the MPO and Sampro) and other organisations are undertaking various initiatives to empower black entrepreneurs to become more successful and contribute to a more competitive South African dairy industry.

This handbook serves as a practical guide for people who would like to become involved in empowerment and transformation of black people in the South African dairy industry, and for black entrepreneurs who need practical guidance in this regard.

As transformation and empowerment initiatives are extremely dynamic and challenging, this product – our first attempt – will be updated continuously with the very latest information.

We therefore trust that this handbook will serve as a guide for:

- black entrepreneurs who want to enter the dairy industry;
- who are employed in the industry, aspiring to expand their horizons; and
- for employers, governmental institutions and others who wish to use it as a tool to contribute meaningfully to transformation in the dairy industry of South Africa.

Nico Fouché
CEO



PURPOSE OF THIS HANDBOOK

The prime purpose of this handbook is to empower black entrepreneurs and institutions in the South African dairy industry with information and guidelines in the process of transformation, and serve as a reference for dairy transformation initiatives of Milk South Africa, its two members and other institutions.

It is important to cover the profile of the South African dairy industry and other activities within the organised dairy industry, as transformation occurs within the broader environment of the industry.

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PROFILE OF THE SOUTH AFRICAN DAIRY INDUSTRY

South African milk producers supply around 7,3 million litres of milk per day and contribute about 7% to the total value of agricultural production. Producer income in 2013 is estimated at R10 500 million and investment capital is around R13 500 million.

Milk producers offer approximately 34 000 sustainable job opportunities per year. Dairy is the fourth-largest agricultural industry in South Africa and produces about 0,5% of the world's milk supply. The per capita consumption of dairy products

equals 54 kg per person per year, as opposed to average world consumption of 107 kg per person.

Approximately 7% of dairy products are traded in the international market. The participation of many countries in the international dairy trade is highly influenced by domestic over- and under-production and climatic conditions, which are subject to unexpected changes.

Worldwide raw milk production is seasonal but the extent of seasonality differs from country to

country. The peak production time in the Northern Hemisphere is in May and in the Southern Hemisphere in October.

South Africa's net export situation often changes owing to factors such as weather patterns and production fluctuation.

The primary dairy industry of South Africa

Number of milk producers

In 2013, South Africa had some 2 000 commercial milk producers and about 100 emerging milk producers. Commercial producers sell the bulk of their milk to the formal commercial market, whereas emerging milk producers are typically producers with around 50 cows who aspire to become commercial milk producers. Although some emerging producers may already be selling their milk to the formal market, they rely on

support from the organised dairy industry and/or government to become sustainable commercial milk producers.

Milk production

Annual milk production increases steadily over time. The total milk to market for 2013 was 2 873 million litres. Milk production typically peaks in October and reaches its lowest point in June. The trend towards higher milk production in pasture-based areas continues. Milk production per province, according to MPO's latest information, is shown in Table 1.

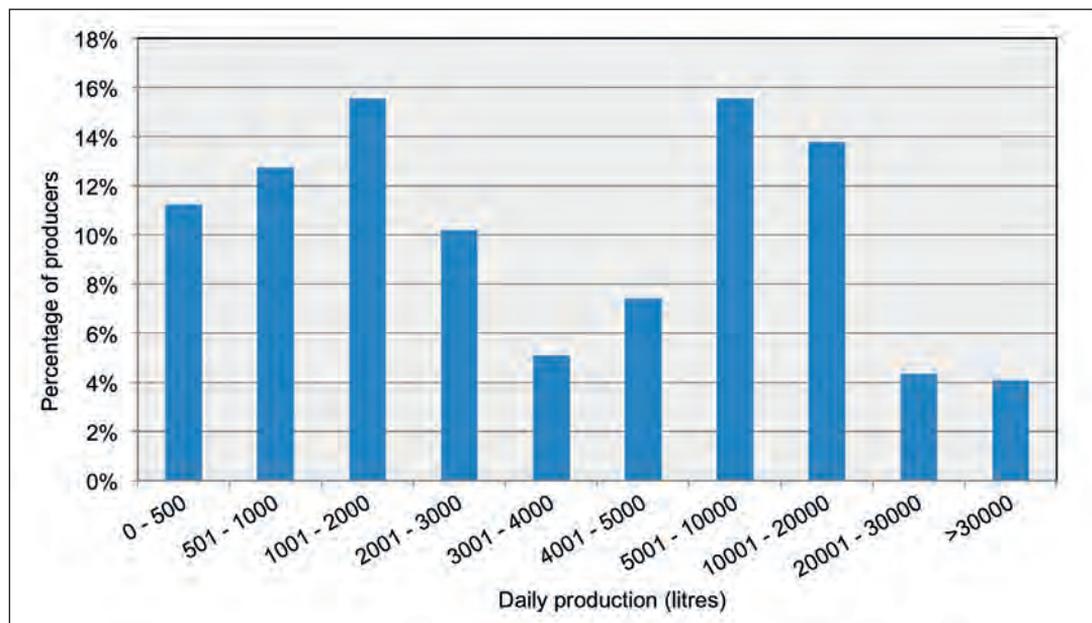
Distribution of milk producers per daily milk production (litre/day)

The distribution of milk producers based on total daily milk production is shown in Figure 1. Fifty-one per cent of producers produce 3 000 litres and less per day and 40% produce more than 4 000 litres per day.

Table 1: Geographical distribution of milk production per province in 2013

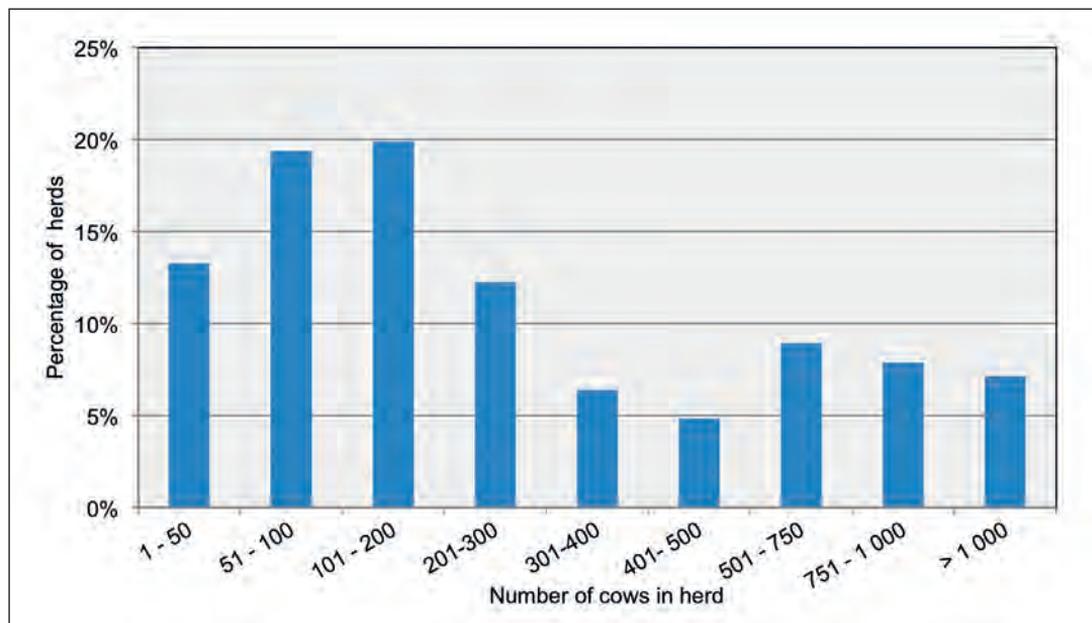
Province	2013
Western Cape	25,2%
Free State	10,2%
Eastern Cape	26,3%
North West	4,5%
Northern Cape	0,3%
Mpumalanga	3,3%
Limpopo	0,9%
KwaZulu-Natal	24,5%
Gauteng	4,7%
Total	100,0%

Figure 1: Distribution of milk producers per daily production (litre/day)¹



Herd distribution

Figure 2: Size distribution of herds, 2013²



¹ Source: MPO Statutory report 2013

² Source: MPO Statutory report 2012

The secondary dairy industry of South Africa

The secondary industry in South Africa consists of a few larger processors operating nationally, a large number of smaller processors, who operate in specific areas, and a number of producers, who sell their own produce directly to retailers and consumers, called producer-distributors (PDs). In 2014, there were 151 milk buyers and 117

producer-distributors registered with Milk SA. The South African dairy market is divided into some 60% liquid and 40% concentrated products. Pasteurised liquid milk and UHT milk are the most prominent liquid products, while hard cheese is the most prominent concentrated product. The estimated composition of the markets for liquid and concentrated products is shown in Figures 3 and 4.

Figure 3: Composition of the South African market for liquid dairy products, 2011³

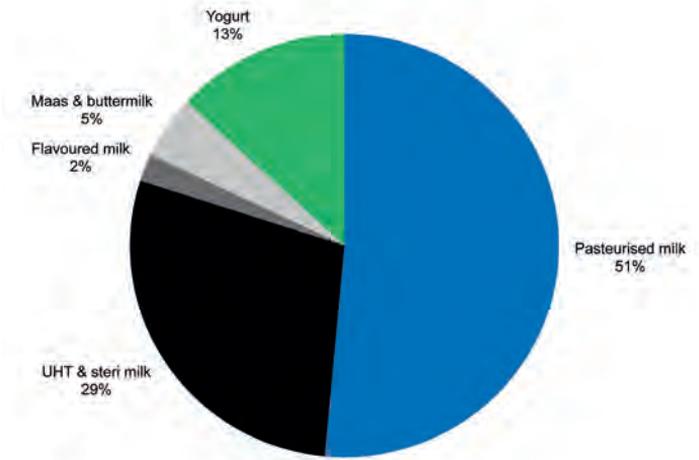
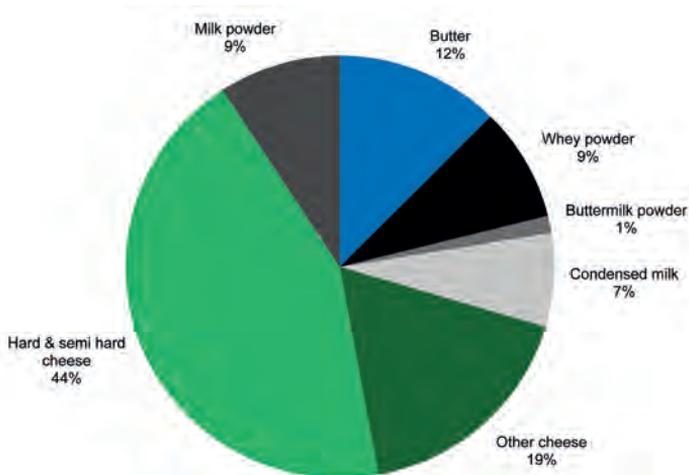


Figure 4: Composition of the South African market for concentrated dairy products, 2011⁴



³ Source: Lacto Data, November 2013

⁴ Source: Lacto Data, May 2013



THE ROLE OF ORGANISATIONS IN THE ORGANISED DAIRY INDUSTRY, WITH PARTICULAR REFERENCE TO TRANSFORMATION SERVICES





Milk South Africa – NPC

Role in the organised dairy industry

Milk South Africa is a well-structured industry organisation, voluntarily established in 2002 by its members, the Milk Producers' Organisation (MPO) and the SA Milk Processors' Organisation (Sampro). Various specialised committees advise Milk South Africa's board of directors.

The vision of Milk SA is to promote a healthy South African dairy community. The strategic direction of Milk South Africa is to:

- broaden the market for milk and other dairy products
- improve the international competitiveness of the dairy industry, and
- empower previously disadvantaged individuals.

The strategic direction has resulted in strategies financed by levies, introduced in terms of the Marketing of Agricultural Products Act, 1996 (Act No. 47 of 1996) ("the Marketing Act").

Since December 2003, Milk South Africa administers statutory regulations published under the Marketing Act in terms of which milk buyers, producer-distributors and importers should register, submit information and pay levies to the company. The objectives of the regulations are to:

- educate consumers about the health and nutritional advantage of milk and other dairy products
- improve the quality and safety of milk and other dairy products
- publish statistical and other information regarding the dairy industry
- promote the practical application of local and

international research and development in South Africa, and

- facilitate the transfer of knowledge and skills to empower previously disadvantaged individuals.

In addition, Milk SA is positioned to be the means through which the primary and secondary industry sectors (MPO and Sampro) deal with common challenges. The intention is not to replace, duplicate or undermine the actions of the MPO or Sampro.

All the projects of Milk SA deal with collective issues (issues that cannot be dealt with effectively by individual raw milk producers, individual milk processors and manufacturers of dairy products, and which can, in terms of the Competition Act, be dealt with by an industry body such as Milk SA), which influence the competitiveness of the South African dairy industry. Obviously, a competitive South African dairy industry is a prerequisite for transformation of the dairy industry.

Role in transformation

Milk SA defines transformation as a managed empowerment process, which results in a growing, successful and sustainable dairy industry with meaningful participation by black entrepreneurs.

The activities of Milk SA are integrated and therefore, transformation is not treated as a stand-alone activity. Each of the projects of Milk SA has a particular purpose but in each, the need for transformation and the impact of the work of the projects on transformation is relevant. For example, the project of Milk SA, which is executed by the Dairy Standard Agency and focuses on quality of dairy products, attend to quality issues relevant in respect of transformation. Another example relates to the fact that market signals are crucial for the effective working of the markets in the dairy industry and successful markets are necessary for a successful dairy industry, which is a prerequisite for transformation.

Because small role players do not have the resources to collect information in respect of market

signals, the industry information project of Milk SA is tasked to ensure that appropriate market signal information is generally available. In the absence of such information, which is available to all role-players, the concentration in the dairy industry will increase and the opportunity for transformation will decrease.

The statutory obligation of Milk SA is the facilitation of the transfer of knowledge and skills to previously disadvantaged individuals. The various activities in this regard are covered in projects executed on behalf of Milk SA by the MPO and Sampro.

In addition, the Minister of Agriculture, Forestry and Fisheries requested Milk SA to promote empowerment through actions not covered by the regulations. This role, which is managed by the transformation manager, is to interact and liaise with all stakeholders in order to facilitate the capturing of information, unlocking resources, identifying transformation requirements, and coordination of activities and resources. In practice, this boils down to the following activities:

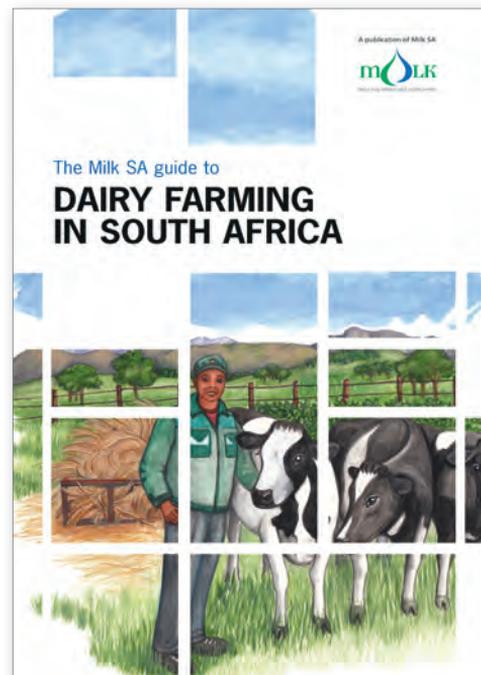
- Facilitation and coordination of implementing the project to promote sustainable commercialisation of existing black dairy farmers. Many existing emerging farmers find it difficult to achieve production levels required to be sustainable commercial farmers. A certain economy of scale is therefore required to bridge the barrier to enter the commercial environment, which amongst others requires a sufficient package of support and a secured market. The objective is to promote the development of existing black milk producers to become sustainable, commercial milk producers through the provision of knowledge, infrastructure and heifers in collaboration with the Development Bank of South Africa, DAFF, local departments of agriculture including state veterinarians, local authorities, the ARC, milk buyers, smallholder producers, an expert advisor, etc. In addition, this enterprise development project requires a disciplined approach, for example, to ensure that the food safety

and quality regulations are met, fodder flow programmes are sufficient, detailed record-keeping is maintained, and the beneficiaries perform in accordance with the contracts.

- The development of a strategic plan for transformation in the dairy industry in conjunction with stakeholders. Provincial and national workshops are held involving relevant stakeholders, including smallholder milk producers and provincial departments of agriculture.
- Updating of a national database of dairy entrepreneurs in conjunction with provincial departments of agriculture and emerging entrepreneurs.
- The sharing of knowledge in respect of transformation goals and successes to establish a shared approach to transformation in the dairy industry by means of a transformation forum.

Publications

The Milk SA guide to dairy farming in South Africa – this book provides insight into the best practices and basic principles of dairy farming for new entrants.





MELKPRODUSENTE-ORGANISASIE
MILK PRODUCERS' ORGANISATION

The Milk Producers' Organisation (MPO) – NPC

Role in the organised dairy industry

The MPO, a non-profit company, was established after the demise of the Milk Board in 1998, to represent and empower milk producers by rendering a variety of innovative services to and on behalf of milk producers. The demographically elected board of directors of the MPO play an important role in the strategic focus of the MPO as representatives of milk producers.

The five core functions of the MPO are market protection and promotion, communication, technology transfer, information, and protection of member interests.

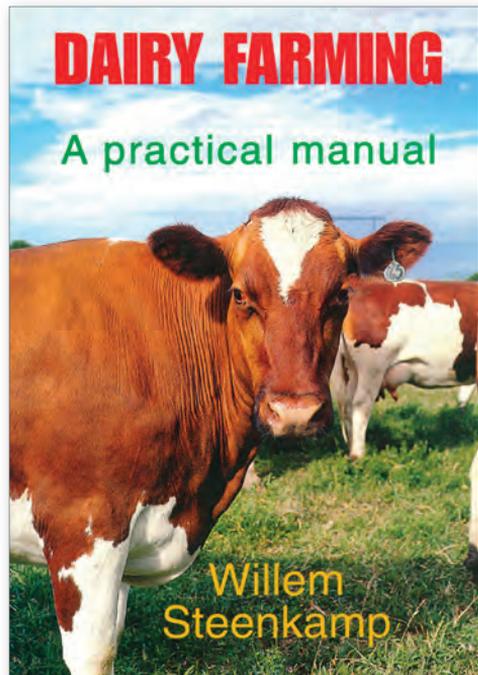
The MPO is a member of Milk SA and nominates four members to its board of directors. The MPO is a member of the Dairy Standard Agency, supports the South African National Committee of the International Dairy Federation (SANCIDF), the South African Society of Dairy Technology (SASDT) and is affiliated to Agri SA and the TAUSA.

Role in transformation

The MPO fulfils its transformation role through the Institute for Dairy Technology and Agri Connect, details of which are available in this publication.

Publications

Dairy farming – a Practical Manual by Willem Steenkamp. This book covers all the key aspects to take into account to become a successful milk producer. Topics covered are, for example, what to look out for when buying a dairy farm, administration, how to manage the workforce, buying cattle, reproduction, milking machines, health care and nutrition."





Suid-Afrikaanse Melkprosesseerders Organisasie
South African Milk Producers Organisation

The SA Milk Processors' Organisation (Sampro) – A Voluntary Association of Members

Role in the organised dairy industry

The South African Milk Processors' Organisation (Sampro) is a voluntary member organisation for the secondary dairy industry in South Africa established in 2003 to provide a unified instrument for the secondary dairy industry to deal with issues of common interest.

Sampro uses advisory committees of which the members are experts from in and outside the secondary dairy industry to study and deal with specialised issues.

Like the MPO, Sampro is a member of Milk SA and nominates four members to the board of directors of Milk SA. It is also a member of the DSA. Sampro supports the SANCIDF and the SASDT.

Role in transformation

Sampro Training is a division of Sampro that conducts projects funded by Milk SA to support transformation by skills development in the secondary industry to supply informed advice on skills development in the broad sense, focusing on technical and related skills and knowledge for dairies.

At the request of processors, learning materials have been (and still are) developed for in-company use in a more non-formal approach to operational skills development, with substantially less theoretical content. These are called coaching manuals. Their content is sourced from the unit standards-based learning materials in abridged format and have found exceptionally wide application. Sampro supplies in-company coaching

and learning material for entry-level learning to promote a culture of learning. The first two programmes are generic and focused in specific activities. For learners who might not enter into "formal" learning, the in-company coaching manuals provide a pathway for continued learning. These manuals are organised into eight programmes. A list of manuals for each of these programmes is available under [Annexure A](#).

Eight such programmes with 75 individual manuals have been developed. This intervention circumvents the perceived bureaucratic and administrative load that participation in "formal" learning with unit standards presents, but do not award credits to learners on the National Learner Record Database (NLRD). It is still valid training to plan, insert into and report on with respect to the workplace skills plan (WSP) and annual training report (ATR) of the Foodbev Seta.

Training material and courses

Sampro Training supplies learning materials for all unit standards contained in dairy qualifications and skills programmes. Some 94 sets of such learning materials support learning based on registered unit standards.

Dairy qualifications (soon to be replaced with new registration numbers) and skills programmes are listed under [Annexure A](#).





The Dairy Standard Agency (DSA) – NPC

Role in the organised dairy industry

The DSA is a non-profit company established by the dairy industry in 2002 to:

- promote the improvement of the quality of milk and other dairy products
- monitor these products for compliance with legal standards, and
- communicate regularly with the authorities as the expert and objective official agency of the dairy industry regarding food safety and quality of dairy products.

The DSA renders the following services to the industry:

- assesses dairy production and processing facilities according to legal requirements and good agricultural, veterinary, hygiene and manufacturing practices
- monitors milk according to food safety and compositional standards
- offers support programmes with information and consultation sessions as well as guideline documentation to assist with planning and remedial steps
- hosts management information systems for processing, storage and dissemination of data and related information
- assists government institutions in respect of compliance certification of production facilities.

Publications

The DSA Safe Milk Processing Code of Practice, Guidelines and Recommendations (COP) – The COP consists of 10 chapters explaining the prerequisites applicable to ensure safe and quality (compositional standards) food products to the consumer. The prerequisites include the milking

shed, collection and receipt of milk, processing, packaging and traceability, cold storage, transportation, laboratory practices, personnel and facility hygiene, building structures, water and air quality, waste, storage, pest control, maintenance, foreign body control, food safety training of personnel and record keeping.

The Laboratory Implementation Programme (LIP) – An effective food-safety management programme requires verification to ensure that incoming raw materials, processing, packing and distribution specifications are controlled and adhered to. This publication provides laboratory work instructions during the processing and packing of milk and other dairy products. Its objective is also to establish an on-site laboratory at the dairy processing facility and assist with microbiological and chemical analytical methods to ensure compliance with legal standards relating to raw material in process and final product specifications.

Guidelines for the interpretation of quality problems in milk – The purpose of this guideline document is to assist the user in the identification of the cause of problems as well as the implementation of remedial action steps to limit the risk of recurrence of food safety and quality (product compositional) non-conformances.

Milk producers' code of practice (Farmers COP) – The code of practice serves as an extension of the DSA's COP and provides information regarding legal standards and food safety principles in a primary milk production facility. It also refers to good agricultural practices in the areas of local environment, facility, equipment, dairy stock and animal health, milk handling, hygiene, training and documentation.

Retail bulk milk guidelines – The sale of bulk milk in the retail sector is governed by health and agriculture legislation. Legislation, however, does not provide detailed requirements in terms of receiving, handling, processing, storage, sale of milk or equipment design. Therefore, these guidelines serve as an extension of the current legislation to help with safe handling and sale of retail bulk milk.



**THE ROLE OF OTHER
INSTITUTIONS IN RESPECT
OF TRANSFORMATION IN
THE DAIRY INDUSTRY**



Instituut vir Suiweltegnologie NPC
Institute for Dairy Technology NPC
Reg no: 2000/015003/08

Institute for Dairy Technology – NPC – *A company affiliated with the MPO*

Role in transformation

Technology transfer

This institute is linked to various livestock industries such as animal health companies, veterinarians, animal scientists, nutritionists, hygienists, agricultural economists and advisors that represent the dairy production spectrum. Together, these partners and the IDT present several information days per year across South Africa to convey the latest technology to commercial and developing milk producers and farm workers. Specialised services such as the development and implementation of dairy projects and dairy business plans are also provided.

Training

The IDT is an AgriSeta-accredited service provider (provider code: PEAT 7675, ETQA ID 694). It presents various skills development programmes from the SAQA qualification Animal Production (Level 1 to 3) as well as various unit standards on Level 4. See [Annexure B](#) for a list of accredited skills programmes as well as IDT market-driven courses. IDT has accredited facilitators, assessors and moderators.

The IDT presents hands-on training on farms or at agricultural institutions. These one-day, three-day or five-day skills-development training programmes are presented in all indigenous languages comprise 30% theoretical learning and 70% practical implementation.

The IDT has been appointed by AgriSeta as the Development Quality Partner for the new Dairy Occupational Qualification. The qualification consists of several modules for a dairy farm worker, dairy farm supervisor and dairy farm manager. The programme will be implemented in 2016. See [Annexure B](#).

Mentorship

The MPO has mandated the IDT to do mentorship and supervision of emerging milk producers in the primary dairy industry. The IDT has established a strategic relationship with DAFF for the implementation of the Agri BEE charter and empowerment in the industry.

The MPO master mentors are experts who select and appoint other mentors according to their knowledge and holistic experience of primary milk production. Emerging milk producers who are keen to become commercial milk producers are selected for mentoring, and are known as mentees.

The MPO master mentors play a strategic and executive role while mentors work one on one with mentees helping them to plan in collaboration with DAFF, based on an approved business plan for each project. The mentor is responsible for mentoring on the management and general supervision of the dairy, covering feed cost analysis, ration formulation, fodder flow planning, herd health, heat observation and recording of breeding, financial planning and recording.

Publications

Protecting your Farm Animals through Immunisation - This book is a handy guide to vaccination programmes that will ensure protection of livestock against the most common threatening diseases.

Vaccines and Immunisation of Farm Animals - A complete guide of all the livestock diseases that occur in South Africa, with indispensable advice on the recognition, treatment, immunisation and available vaccines for each disease.



AgriConnect (Pty) Ltd – A company affiliated with the MPO

Publications

The Dairy Mail – This monthly magazine is the official mouthpiece of the MPO aimed primarily at the milk producer. It is sent to every commercial milk producer in the country as well as opinion-makers in the secondary industry, state departments, universities and other dairy experts.

Udder health and the milking machine – A practical guide on mastitis, which is probably one of the most underestimated effects on a milk producer's profitability and this book shows how to control it effectively.

Cattle breeds of South Africa – A guide to cattle breeds in South Africa and the integral role they play in our lives as well as statistics and historical facts supplied by the various breed societies, as well as some topical articles from other industry role players.

Dairy Farming at your Fingertips – A manual for teaching all dairy farm workers, aspiring dairy producers and even smallholder producers about producing quality milk under hygienic circumstances.



FMCG Training Solutions CC

This training provider has a formal working agreement with Sampro's training division. Services in-

clude facilitation of all dairy learnerships and skills programmes, development of training material and assessments tools, workplace assessments of employees and learners, internal/external moderation. Consulting on human capital development functions and operational functions.

Contact details: Wayne van Rensburg at Tel 021 975 8635 / 083 545 8253 or wayne@fmcgts.co.za



Agri Skills Transfer (Pty) Ltd

AgriSkills Transfer was established in 2004 for training mainly in the agricultural sector (primary and secondary) and focuses on skills development on a national level. They are fully accredited with AgriSETA. The head office is in Groenkloof, Pretoria, from where training services are coordinated for associates in all provinces. All learning materials are developed on the SAQA system or the QCTO, where appropriate. They decided to align with outcomes-based education (OBE) to develop their courses according to the National Qualifications Framework (NQF). The company has the capacity and expertise to offer learnerships and short courses in most fields of agriculture and other disciplines.

Courses on offer in the primary industry are listed in [Annexure D](#).

Contact Danie Steyn at Tel 012 460 9585, fax 012 460 2617, cell 083 2716 378 or e-mail danie@agriskills.net.



THE ROLE OF GOVERNMENT AND PARASTATALS IN RESPECT OF TRANSFORMATION IN THE DAIRY INDUSTRY



The Directorate of Education, Training and Extension Services of DAFF

This directorate develops necessary agricultural skills among black people to ensure fair participation in the agricultural sector based on the Skills Development Act, the Skills Development Levies Act, the Higher Education Act, the Further

Education and Training Colleges Bill, the White Paper on Education, the Sector Strategic Plan and the National Agricultural Education and Training Strategy.

The directorate ensures that producers and other stakeholders have access to agricultural skills for the development of agriculture as an industry.

Therefore, the directorate is responsible for:

- development and assistance with the implementation of the National Agricultural Education and Training Strategy
- an expansion and advice service
- a plan for future governance of agricultural colleges
- reports on agricultural education and training and targeted training programmes, as well as ensuring generation of agricultural qualifications for the advancement of agriculture
- liaising with agricultural sector education and training authorities to ensure their work is in line with the strategic priorities of the department
- assisting with the development of an implementation plan between the departments of Agriculture and Education for agricultural education and training, and
- coordinating and managing international agricultural training.

Contact details

Director: Education, Training and Extension Services

Department of Agriculture: Agriculture Place
Private Bag X 250, PRETORIA, 0001

Tel: 012 319 7028

Fax: 012 319 7271

E-mail: detes@nda.agric.za

The Sub-directorate: Sector Skills Development

The sub-directorate develops producers and other stakeholders in the agricultural sector through training and capacity building and focuses on the following programmes:

- Experiential training, internship and professional development programmes for students who need experiential training to graduate, internships for qualified unemployed graduates who need practical experience to improve employability as well as young people who

want to work in the export market or business entrepreneurship and the Young Professional Development Programme for young people with degrees such as BSc, BSc Agric, BSc Agricultural Engineering, BVSc or a post-graduate degree in agriculture or natural science who want to study further and do an honours, masters or PhD that will lead to innovation in critical scarce skills in agriculture.

- External bursary scheme to recruit young people to the department's identified scarce and critical skills in agriculture programme where successful applicants receive a comprehensive bursary to study further and serve the department after completing their studies.
- Sector skills training that focuses on implementation of service level agreements between the department and agricultural line function SETAs, generation of qualifications as well as learnerships and skills programmes conducted by accredited institutions and training providers in the entire agricultural sector.
- Commodity-based mentorship programme in partnership with agricultural commodity Organisations to build capacity and transfer technical and business skills to emerging milk producers to assist them to become independent, profitable and sustainable.
- Training and capacity building of CASP⁵ beneficiaries to coordinate and facilitate provincial departments of agriculture to implement skills assessments of projects beneficiaries, their training and the generation of training reports.

Eastern Cape Department of Agriculture and Rural Development

The core function of the department is to facilitate agricultural production in the Eastern Cape by providing technical support to producers and community-based initiatives and creating a conducive environment to increase investment in agriculture.

⁵ Comprehensive Agricultural Support Programme. The aim of this programme is to provide post-settlement support to the targeted beneficiaries of land reform and to other producers who have acquired land through private means and are for example, engaged in value-adding enterprises domestically or involved in export.

Agricultural training is offered at the Fort Cox and Tsolo Agricultural Colleges.

The Department of Agriculture in the Eastern Cape gives a conditional grant to provide support services, promote and assist with agricultural development. It is targeted at beneficiaries of land reform, previously disadvantaged communities and producers, including LRAD⁶ beneficiaries, restitution beneficiaries, redistribution beneficiaries, settlement land acquisition grant beneficiaries and private producers.

How to qualify

Projects must be economically viable, aimed at sustainable use and conservation of resources and be socially and politically sustainable, have the potential to improve household food security, benefit target groups, promote short and long-term job creation, and use appropriate technology. Project owners must show the ability to plan, manage and maintain the project in the long term and community ownership and community contribution is preferred as well as skills and capacity development within the community and gender and disability sensitivity. Projects must be initiated and driven by communities or producers and land ownership should be clearly defined.

Applicants must also give proof of production and financial records and medium to long-term access to land, must be South African citizens and a historically disadvantaged individual or group. Recipients must show they are sticking to the approved original business plan and sign a memorandum of understanding with the Department of Agriculture.

Funding is a once-off conditional grant for off-farm and on-farm infrastructure and production inputs, marketing infrastructure and business development, technical and advisory assistance and information and knowledge management.

Recipients will be monitored and evaluated by the CASP and the manager coordination.

How to apply

Application forms are available from local agricultural offices where extension officers will help to complete and submit forms. Funds will be allocated to approved projects with a comprehensive and viable business plan with clear objectives and outcomes.

Contact details

Department of Agriculture and Rural Development – Eastern Cape

Media Liaison Officer: Mr Thozzi Manyisana

Mail: Private Bag X0040, BISHO, 5605

Independence Avenue, BISHO

Tel: (040) 609 3472/74

Fax: (040) 636 3462

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Free State Department of Agriculture

The Directorates and sections of the Department at the Glen Agricultural College are:

- Training.
- Farming information – computerising agricultural development districts using the Geographic Information System (GIS). The collection of norms and production techniques on ecotope level, the composition of a macro soil plan for the Free State, used for simulation models to predict veld and crop production, crop estimates by means of simulation models in GIS environment, as well as irrigation scheduling are carried out continuously.
- Farming system research and extension (FSRE). Animal and pasture scientists are involved in different farming system research projects aimed at the development of economic farming project practices for dairy and beef herds

⁶ Land Distribution for Agricultural Development. The Land Redistribution for Agricultural Development Programme was designed to help previously disadvantaged citizens from African, Coloured and Indian communities to buy land or agricultural implements specifically for agricultural purposes.

as well as wool and mutton flocks.

- Agricultural economics. Agronomic research is aimed at the development of production practices, which could stabilise dry-land production. Priority is given to practices using rain effectively. Different irrigation methods are investigated within the recommended production systems.
- Engineering services.
- The farm section.

Two laboratories provide analytical services to producers regarding feed and soil analyses.

Contact details

Department of Agriculture – Free State
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Gauteng Department of Agriculture, Conservation and Environment (DACE)

The Directorate Agriculture in Gauteng is committed to the promotion of sustainable agriculture through a multidimensional, participatory approach in the execution of amongst others, the following sub-programme activities:

- Household-level food production, which provides for establishing and maintaining communal food production units in collaboration with local authorities. It targets resource-poor communities with special reference to women and young people.
- Resource evaluation and land acquisition to ensure that land, suitable for agriculture and earmarked for allocation under the Gauteng Small-Producer Settlement Programme, is used to its full potential in a sustainable way.
- Organisational development and training to engage a participatory approach in enhancing responsibilities and capacity building of small-producer communities to take charge of

their own development.

- Farm management support to assist settled producers to draw up business plans for their farming enterprises and to implement the plans successfully.
- Agricultural production technology that focuses on the adaptation of production technology to local needs as well as providing specialised information and training services to extension officers. The delivery of the programme is based on the principles of community-directed, use of labour-intensive methods for job creation, focus on the poorest of the poor and value addition.

Contact details

Department of Agriculture and Rural Development – Gauteng
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KwaZulu-Natal Department of Agriculture and Environmental Affairs

In KwaZulu-Natal the department renders the following services:

- Veterinary services such as veterinary laboratory diagnosis, animal health, field services and veterinary public health. This directorate controls the movement of meat from arrival to despatch within the precincts of all red meat, pig and poultry abattoirs.
- Technology development and training is responsible for formulating and generating technology required by the farming community and agricultural industry in the province.
- Engineering and soil conservation with the priority of soil preservation as the most valuable natural agricultural resource. Sub-surface drainage, soil conservation structures and to facilitate the development of agricultural infrastructure in both rural and commercial farming

areas, are also part of the activities.

- Agricultural development support services is responsible for the agricultural support services to the regions, which includes extension training, mobile video training, extension aids development, state land (management, maintenance and administration) and agricultural economics and marketing. The home economics sector caters for family management, homecare, affordable home improvement, consumer education and promotion of viable home industries. Furthermore, the directorate renders assistance to cooperatives.
- Environmental management is responsible for the environmental impact management. It provides integrated environmental management services, determines norms and standards and renders environmental audit and rehabilitation. It controls pollution and waste management, as well as atmospheric and noise pollution.
- Regional services with the support of the department aims to decentralise efforts to promote the participation of producers in all magisterial districts. The ward extension officer reports to an agricultural district officer. A number of district officers form regions, four of which exist as directorates in the province. The northwestern region (Ladysmith), northeast (Ulundi/Eshowe), southwest (Hilton), and southeast (Pietermaritzburg/Durban) regions have specialist advisors, home economic staff, soil conservation officers and engineering staff who are responsible for coordinated extension, rural development and RDP projects.

Training is provided at the Cedara and Owen Sitole colleges of agriculture. These colleges are tertiary education institutions with a non-formal training section responsible for training staff, producers and agricultural labourers.

Contact details

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Limpopo Department of Agriculture and Environment

Limpopo is divided into six regions with about 115 service centres and approximately 652 wards. The department consists of three chief directorates:

- The Chief Directorate Regional Services with the three directorates of Agricultural and Rural Development, Regional Services and Technology Development.
- The Chief Directorate Support Services with the three directorates of Agricultural Engineering, Veterinary Services and Administrative Services.
- The Chief Directorate Environmental Affairs with three directorates of Resource Management, southern (A) and western region (B), Resource Management northern region (C) and Lowveld (D), and Professional Services.

Contact details

Department of Agriculture Limpopo

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Mpumalanga Department of Agriculture, Conservation and the Environment

The department has identified the following functions to achieve its mission:

- agricultural training (formal and non-formal)
- extension and advisory services
- technology development and research
- facilitation of agricultural community development and rural development

- resource management
- regulatory services
- veterinary services
- administration and liaison services
- environmental management
- environmental education
- nature conservation.

Mpumalanga Parks Board (Nature Conservation) and the Mpumalanga Agricultural Development Corporation (agricultural development) carry out certain functions on behalf of the department.

- In order to carry out these functions the department is following a decentralisation approach. Its head office is at Nelspruit. The department has three directorates of regional services, with regional offices at Ermelo (southern Highveld), KwaMhlanga (northern Highveld) and Nelspruit (Lowveld).
- The Nooitgedacht Agricultural Development Centre at Ermelo and Athole Research Farm near Amsterdam are responsible for need-directed technology development, mainly for the Highveld areas.
- A farm-system research-extension unit conducts on-farm research and mainly operates on small-producer plots in the lowveld region. The Agricultural Research Council makes an important contribution to intensive crop cultivation in the lowveld area as well as summer grain, range and forage research in the Highveld areas.
- Resource management and planning, agricultural economics and engineering services are also components of the Directorate Technology Support Services.
- The Directorate Veterinary Services, with its headquarters in Nelspruit, also operates on a decentralised basis. This directorate has five sub-directorates: Veterinary Public Health, Veterinary Technical Support Services and three regional components of Animal Health.

The Directorate of Environmental Management is provincially responsible for the implementation of the National Environmental Management Act and for pollution and waste management.

The Directorate Environmental Education presents environmental awareness courses and manages several environmental education centres.

Agricultural training is coordinated by the Lowveld College of Agriculture in Nelspruit. Apart from offering formal diploma courses in plant production and extension, its non-formal component offers a large number of short courses, mainly for emerging producers.

Contact details

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Website: www.dardla.mpg.gov.za

Northern Cape Department of Agriculture and Land Affairs

The department has undertaken to perform the following key services:

- Provision of support services to producers, their advisers and other users of agricultural services.
- Implementation of and advice to upcoming producers on small-scale development projects.
- Advisory services to the farming community for the sustainable use of natural resources.
- Provision of post-settlement support to land-reform beneficiaries and support in the management of agricultural state land in the province.
- Identification of agricultural research needs in the province, mobilisation of research partners; solicitation for funding of appropriate projects and participation in on-farm research.
- Supplying training in agriculture and related fields, particularly in the areas of small-stock farming.
- Control of animal diseases and the import and export of animals and animal products.
- Promotion of proper standards of hygiene in the slaughtering of animals.

- Services to protect, manage and promote the sustainable use of the biological diversity and habitats of the province.
- The management, conservation and development of provincial nature reserves and other protected areas.
- Development and management of tourism facilities in provincial reserves in cooperation with the Northern Cape Tourism Authority.
- The management and protection of the physical environment of the province.
- Provision of scientific support and associated services to enable the Nature Conservation Services to develop policy and reform its functions.
- Rendering and promoting environmental education and communication.

Apart from administration and auxiliary services, the objectives of the department are organised into programmes for agricultural development, veterinary services, conservation management, environmental management and specialist environmental services.

Formal agricultural training for the Northern Cape and Eastern Cape areas is offered by the Groofofontein College of Agriculture.

Contact details

Department of Agriculture, Land Reform and Rural Development – Northern Cape
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Website: www.agrinc.gov.za

North-West Department of Agriculture, Conservation and the Environment

The strategic goals of the department are to:

- provide natural resource management direction
- mobilise the provision of resources for sustain-

able development

- promote an integrated, equitable natural resource management system
- foster community sensitivity to sustainable natural resource use
- achieve service excellence.

The directorates of Environmental Conservation Management, Veterinary Services and Technical Support Service assist producers in the province.

Contact details

Department of Agriculture – North-West
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Website: www.nwpg.gov.za/Agriculture

Western Cape Department of Agriculture

The Department of Agriculture in the Western Cape has a commodity-focused approach to support new and existing farming ventures.

The department has a Dairy Commodity Project Assessment Committee (CPAC), which follows a commodity approach to allocate CASP funds to black producers entering the industry.

Dairy CPAC is one of these CPACs in the Western Cape. The Department of Agriculture has identified three agricultural organisations of which Agri Mega is one, administer and implement the agreement between the department, the commodity organisation, the MPO and the United South African Agricultural Association (USAAA).

Agri Mega handles the total administration of project applications and the allocation of funds awarded to projects and regularly reports to CPAC. The department's supervisors and their advisors are the first point of contact for new applicants.

How to qualify

Projects must contribute to increased production and sales, economic growth and sustainable employment, land and agrarian reform, increased exports and production for markets, food security, increased skills development in the sector, BEE scorecard, and environmental sustainability and comply with employment equity legislation, labour laws and all other related agricultural laws.

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Website: www.elsenburg.com

Agricultural Research Council (ARC)

The Animal Health and Animal Production section of the livestock business division was developed out of a process of rationalising and restructuring the animal science institutes at Irene (the Animal Improvement Institute and the Animal Nutrition and Animal Products Institute) and the Range and Forage Institute at Roodeplaats.

The Animal Health section in the Onderstepoort Veterinary Institute (OVI)

This section is involved in:

- executing veterinary research to improve existing vaccines, diagnostic products and to develop new ones
- diagnostic services for enhanced disease prevention, control and surveillance, which plays a significant role in maintaining the required animal health status and trade in animals and animal products in South Africa and the region, and
- producing vaccines for foot-and-mouth and blood diseases.

Contact details

ARC-OVI
Tel: 012 529 9511
Fax: 012 565 6573
E-mail: ovi-info@arc.agric.za
Private Bag X5, Onderstepoort, 0110

ARC-Animal Production Institute (API)

The focus is on:

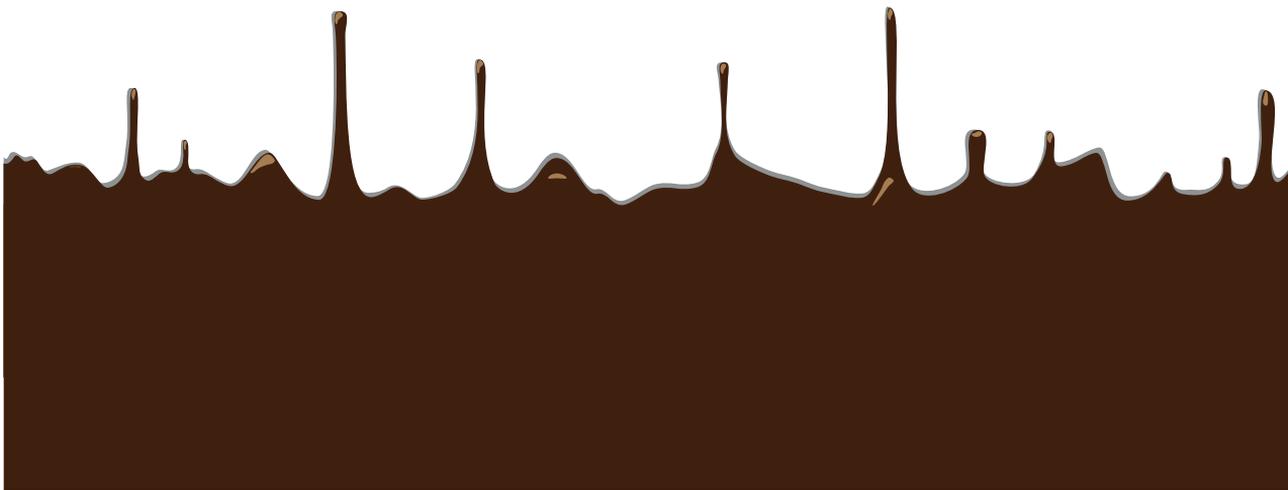
- developing technologies to improve the quality of animals and developing genetic and physiological methods to identify and study superior livestock breeding material to improve the efficiency and production of the national herd
- promoting animal production through improved nutrition research on beef and dairy cattle, sheep, pigs, goats and poultry to enhance the quality of meat and dairy products, and
- holistic and integrated land-use strategies, and sustainable livestock and rangeland management systems with research on vegetation, rehabilitation ecology, pasture agronomy and vegetation biology.

Courses offered by the ARC are listed under **Annexure C**.

Contact details

ARC-API
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Private Bag X2, Irene, 0062





FINANCING INSTITUTIONS AND PRODUCTS

Them bani International Guarantee Fund

The Them bani International Guarantee Fund (TIGF), a non-profit organisation, provides guarantees designed to assist organisations that are unable to provide requisite collateral to commercial financiers or banks. The TIGF encourages banks to lend money to disadvantaged communities for self-sustainable projects. Every application is evaluated on merit. The TIGF does not lend money or guarantee loans, but guarantees loans to borrowers approved by banks for one to three years and does not guarantee that a bank will lend money.

How to apply

- Applicants must submit a complete business plan to the bank and the TIGF including budgets and cash-flow projections showing the prospects, capacity to repay the loan and audited accounts and current financial statements for the past two financial years. In addition, the applicant must prove security and/or collateral as deposit and an analysis of the strengths, weaknesses, opportunities and threats and information such as registration certificates, memorandum and articles of association.
- The borrower cannot ask for more than 75% of the credit facility up to R10 million.

Contact details

Telephone: 012 342 1913

E-mail: info@tigf.co.za

Postal address: Them bani International Guarantee Fund, Postnet Suite 205, Private Bag X 15, Menlo Park, Pretoria

Physical address: 1237 Pretorius Street, Hatfield, Pretoria

Website: www.tigf.co.za

Small Enterprise Finance Agency (Sefa)

Small Enterprise Finance Agency (SOC) commonly known as Sefa was established on 1 April 2012 as a result of the merger of South African Micro Apex Fund, Khula Enterprise Finance and the small business activities of the International Development Corporation. Sefa's mandate is to foster the establishment, survival and growth of SMMEs and contribute towards poverty alleviation and job creation. Sefa has a regional footprint of nine offices around the country. Loans are provided directly to small and medium-sized enterprises as well as co-operatives operating in all sectors of the economy. Facilities range from R50 000 to a maximum of R5 million.

Contact details

Telephone: 086 000 7332
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Website: www.sefa.org.za

The National Empowerment Fund

The iMbewu Fund helps black entrepreneurs start new businesses and existing black-owned enterprises. The uMnotho Fund improves access to BEE capital. New Venture Finance provides capital. Expansion Capital helps businesses grow. The Rural and Community Development Fund finances sustainable enterprises for rural communities.

Once the business plan has been finalised, applicants must complete an application form available on the fund's website, www.nefcorp.co.za. The application can then be submitted, in person, by e-mail, fax or post. The submission must include the business plan with financial projections, certified company registration documents, supplier agreements, lease agreements and contracts.

The NEF Mentorship Programme supports businesses that have been financed by the fund. The NEF Business Planner provides a free business plan template, which can be used to plan for the future or support an application for financing. It also provides a cash-flow projection tool, which can be used for cash-flow management in the business. The results of both the template and the

cash-flow tool are downloadable, and can be used at the office or when meeting with financial institutions, partners, associates and suppliers. The programme aims to promote transformation and focuses on the meaningful transfer of important business skills.

The NEF offers a free telephone support centre with consultants who are available to talk people through the process of completing a business plan or help with queries about the cash flow model. Further information is available on the NEF's website www.nefcorp.co.za where there is also a direct link to the NEF Business Planner.

Contact details

Telephone: 011 305 8000 or 0861 843 633.
E-mail: info@nefcorp.co.za
Postal address: PO Box 31, Melrose Arch, Melrose North, 2076
Website: www.nefcorp.co.za

Commercial bank finance opportunities

Commercial banks such as FNB, Absa, Standard Bank and Nedbank offer medium and long term loans to help finance the establishment and expansion of projects. Detailed business plans and security are important.

Advice to consider before applying for loans

- You will have to give convincing evidence that you will be able to repay the loan, including interest and other applicable fees out of your farming proceeds or from other sources of income, which is usually indicated by a cash-flow budget if it is an existing farming operation or a business plan if it is a new farming venture. This cash-flow must indicate seasonal, regular and irregular income as well as foreseen and unforeseen expenses as well as your withdrawals for living expenses. Interest charged is applicable to clients and the transaction individually and is linked to the prime rate, which indicates the cost of funds.
- You will have to have the majority ownership in your farming business. This means that the

bank will not extend more credit than the value you own in the business.

- Your balance sheet will have to show sufficient net assets to offer sufficient security in the event that the farming business may fail. This is to ensure that the bank's depositors, whose money has been lent to you, will not be lost. In most cases, a mortgage bond will be taken over the farm property equal to the bank's realistic valuation thereof.
- The bank will have to be satisfied that you have sufficient knowledge, skills and experience to manage the farming business to achieve the financial results that you indicated in your cash flow.
- It is in your interest to approach your existing bank where you have accounts, as you would already have established a record of your financial conduct.

Long-term loans or mortgage loans

Logically, if someone wants to start farming, the first thing he/she requires is farmland. Farmland is expensive; therefore, the producer will opt to repay the loan over a longer period, possibly 25 years or longer.

- If you are a first-time buyer, the bank will expect you to contribute a minimum of 40% of the bank's valuation of the property. As security for the loan, banks will take a bond (mortgage) over the property. This means that if the producer does not meet his payment commitments, he will forfeit the farm to the bank.
- Long-term loans can also be used for fixed improvements to the farm. These improvements increase the value of the farm and their productive lifespan exceeds that of the repayment term. Examples of such improvements are the building of dams, fencing grazing camps, building kraals, silos, building irrigation infrastructure, drainage ditches, establish pastures, etc.

Project loans or medium-term loans

Once the producer buys the farm, he may still need working capital to develop production capacity. The repayment period of these loans is

up to seven years, depending on their productive lifespan. Loans to buy vehicles, implements and machinery are also medium-term loans (up to five years) but these are financed under hire purchase or lease agreements.

Short-term, seasonal or production loans

The purpose of such a loan is to provide finance to cover production, processing and marketing costs. These loans can be used for fodder flow, veterinary expenses, farm wages and salaries, water and electricity, repairs, fuel and packaging.

Production loans can be accessed via bank overdraft facilities and short-term lenders, such as co-operatives and input suppliers. At the end of the production cycle or season, the overdraft must be repaid in full. In this sense, these are not really "loans" but overdraft facilities with advances and repayments during and at the end of a production season. If there is a bad harvest or prices are low so that the debt cannot be paid, the producer must make arrangements with his bank to consolidate the debt under a loan agreement so that the producer can repay the outstanding amount over a longer period.

To obtain a production loan, a cash-flow budget substantiated by a production plan needs to be handed in with the application forms so that the bank can assess the possibility of realising a profit and being able to repay the loan. For the production of grains and oilseeds, FNB has a specially packaged finance facility that provides for finance, comprehensive insurance, ability to manage the selling price of the product and a market for the physical product.





TRANSFORMATION MODELS

Introduction

The dairy industry has been actively involved in supporting emerging milk producers through mentorship and helping them to establish joint ventures and share-milking schemes.

The following elements are essential for the establishment and viability of a transformation project:

- Personal attributes of integrity, commitment, passion and hard work as well as the relevant knowledge and technical ability to be successful.
- A viable business plan that forms the basis of the venture drawn up by a knowledgeable institution in cooperation with the entrepreneur.
- This plan must take into account any problems and plans to resolve problems.
- A viable business model must be selected from the business models available for effective transformation.
- The best premises or area where the business or venture will operate, must be identified. This could be agricultural land for dairy or commercial premises for a processing plant.
- Finance and investment for the project must be procured from a financial or government institution.
- The entrepreneur and workforce must be properly trained.
- Mentoring and supervision is important to reduce the high level of empowerment project failures.

- Adequate infrastructure, including transport, electricity, water, security and communication.

Existing models: principles, practices and successes

Models for transformation in dairy farming can be structured into three tiers according to the size of the farm:

Upper level: milking 300 cows or more

Principle

The size of this dairy makes it easier to exploit economies of scale and therefore to be successful.

Practices

Emerging producers supply land and pastures while already successful milk producers supply animals and management, and do mentoring because they have a vested interest in the success of the project.

Successes

Successes at this level are usually joint ventures where the beneficiaries form partnerships with successful commercial milk producers.

Examples

- Rebokrant, Witkleibosch, Rebokrant Dairy Development Trust, Doringrug and Snyklip (Amafingo Development Trust) have all received most of their funding from LRAD and/or CASP to buy land and infrastructure.
- Amadlelo Agri was formed by a number of commercial milk producers in KwaZulu-Natal and the Eastern Cape. They pooled their funds in an investment company that joined with other partners as well as the Land Bank to form Amadlelo Agri, which manages three commercial dairies: Fort Hare Dairy Trust, Middledrift Dairy and Keiskama Dairy. Fort Hare Dairy Trust and Middledrift operate on a profit, milking 800 cows.

- A share milking partnership⁷ is functioning successfully in the Eastern Cape, where Grasslands Development Trust and Grasslands Agriculture were formed by 49 employees of Grasslands Agriculture. The Trust bought a farm for about R7 million with funding provided by LRAD, a KHULA/REF loan from Standard Bank, while the infrastructure was funded partly by a grant from the Eastern Cape Department of Agriculture and a further KHULA/REF loan from Standard Bank. In total, 65% of the funding came from long-term loans. The trust repaid all its debts within seven years. Grasslands Development Trust provides the land and infrastructure, while the livestock, moveable equipment, management and labour are come from Grasslands Agriculture. The trust, with an annual turnover of R7,5 million, milks 750 cows with the share milker, Grasslands Agriculture.

Middle level: milking between 100 and 250 cows.

Principle

The upper third of these producers is fairly profitable, the middle third does well in good times and the lower third is still establishing their farms.

Practice

Mentoring emerging producers at this level helps them move into the upper third of this category. In this case, mentoring comes at a cost, because the mentor has no direct financial interest in the emerging producer's business.

Successes

Some emerging producers have advanced to the category of milking more than 100 cows and have become independent after some form of mentorship or are still mentored.

⁷ A share milking partnership is where two or more milk producers work together, for example, where the producers co-own a herd of cattle, sharing the cost and income.

Examples

- Jakkalskraal Trust near Plettenberg Bay is operating very successfully, milking 230 cows. They have benefited from some mentorship, but are presently part of the local study group and are a going concern.
- In Elim in the Western Cape, a dairy has also been established through grants from the Department of Agriculture in the Western Cape. This dairy is still developing and will only become profitable when a larger number of cows are in production off pasture. It is run by a board of directors and enjoys the input of an advisory committee and mentorship is provided by the MPO's Institute for Dairy Technology.

Lower level: milking fewer than 100 cows

Principle

In need of mentoring, specialised extension and support.

Practice

These producers have a low turnover, receive a low milk price, have lack of infrastructure, poor fodder flow planning and little or no access to finance.

Successes

Milk producers at these levels are usually not successful. CenDel, on behalf of the MPO, became part of the pilot Master Mentors Programme of DAFF in 2007 and assisted for two years with 13 dairy projects involving 198 individuals, of which 98 were women and 45 youths. The Master Mentor Programme is now the responsibility of the provincial governments.





SUCCESS STORIES OF TRANSFORMATION PROJECTS IN THE PRIMARY AND SECONDARY DAIRY INDUSTRY SECTORS



Amadlelo Agri

Amadlelo was established by 70 commercial milk producers from the Eastern Cape and KwaZulu-Natal in 2004. They realised that the keys to successful transformation in the agricultural sector lay with commercial producers who had the necessary skills and experience to mentor and collaborate with emerging producers. The first step in insuring successful farming was the transfer of



University of Fort Hare *Together in Excellence*

skills and experience from successful milk producers to students, farm managers and labourers.

The University of Fort Hare was approached to collaborate in a process of hands-on skills trans-

fer. This led to the creation of a unique empowerment project on the outskirts of Alice in the Eastern Cape. The Fort Hare Dairy Trust is a profit-based dairy initiative, milking 800 cows through a modern dairy facility on land belonging to the university. Shareholders include the university, which allows interns to learn hands-on about dairy farming. Amadlelo is accordingly looking for unutilised or underutilised farm land in the area to develop into sustainable agricultural farms and transfer skills to previously disadvantaged individuals. Amadlelo selects students from various technical universities and other institutions annually and places them on farms within the Amadlelo group. They are then mentored by highly successful milk producers in all aspects of the dairy farming.

In 2013, the Amadlelo Foundation was created as the not-for-profit arm of Amadlelo Agri, to spread the core finance beyond the founding investors and continue fully new and existing projects. New projects will create new opportunities for employing black community members at a senior management level, to general staffing level. Beyond the individual projects, the Amadlelo

Foundation has committed a substantial amount per year to Fort Hare University for a bursary fund to develop South Africa's black youth further.

Four projects were established by Amadlelo Agri: the Fort Hare Dairy Trust, Middeldrift Dairy Farm, Keiskamma Irrigation Scheme and Ncera Macadamia Project.

The Fort Hare Dairy Trust

The Fort Hare Dairy Trust is a for-profit dairy farm established in 2007. It is an 800-cow commercial dairy operation and involves teaching centres to train students in farm management. It started production in 2007 and is already economically viable while the first student graduates have already moved on to new projects as junior managers.

The project is located nearby the town of Alice in the Eastern Cape, which is the centre of a fertile dairy cattle region. A group of successful commercial producers is mentoring black farm workers on this farm to become successful farm managers and owners. Maize to feed the cattle is sourced from farms in the district.



Fort Hare Dairy Trust (Photo courtesy of Amadlelo Agri)

Fort Hare Dairy Trust (Photo taken by Fidelis Zvomuya)



Middelrift Dairy Trust

The Middelrift Dairy Trust with 600 cows started production in November 2008 and broke even in March 2009. A dairy farm was established on land owned by 65 families in the Middelrift community, who had minimal access to farming skills or equipment, with funding from the National Empowerment Fund and Amadlelo Agri, which also donated 600 cows. The milk is collected and bought by Clover Dairy. The farm has only been in operation since October 2008, but it already showing good growth, both in terms of the number of people employed, and the amount of milk

produced. The aim is to employ 30 local people full time, train a black female to manage the farm and produce 3,8 million litres of milk per year. Students from the University of Fort Hare are also identified and trained in farm management, and will help to manage to project in the future.

The project aims to redress the imbalances created by the land redistribution programme by training local people in farm management and providing financial assistance for start-up to make the farm more profitable and sustainable in the long run. So far, 16 permanent workers from the com-



Middelrift Dairy Trust (Photo courtesy of Amadlelo Agri)



Middelrift Dairy Trust (Photo courtesy of Amadlelo Agri)



Middeldrift Dairy Trust (Photo courtesy of Amadlelo Agri)

munity are employed on the farm and the farm has produced 1,2 million litres of milk in 2011.

The project will also train and employ a further 14 community members within three years. The project has a great effect on the lives of the workers and their dependants, while helping the entire community to establish large-scale farming initiatives.

The farm will be able to produce more milk in the future as the soil becomes better and the heifers grow and are able to produce more milk. The National Empowerment Fund provided R9,92 million, while Amadlelo provided 600 cows and R3,5 million as cost overruns. Amadlelo also provided technical assistance and a salary for the initial farm manager.

Partnerships: National Empowerment Fund, Amadlelo Agri, Clover Dairy, Fort Hare University, Provincial Departments of Agriculture, Land Bank, Kula Development Facilitators, TGK Farming.

Keiskamma Irrigation Scheme

This is a joint venture between emerging milk producers, Department of Agriculture and Amadlelo to resuscitate 600 ha of irrigation and eventually milk 2 000 cows. The first phase started production in March 2010 and the scheme milked some 900 cows in 2011. Once the second phase of irrigation resuscitation has been finalised, the project will be milking 1 800 cows from gravity-fed irrigation on 660 ha of irrigable area. This project will benefit 36 producers and some 185 beneficiaries in all, and employ 40 people once in full production.

Keiskammahoek Irrigation Scheme (Photo courtesy of Amadlelo Agri)



Keiskammahoek Irrigation Scheme (Photo courtesy of Amadlelo Agri)





Shiloh Irrigation Scheme

This is a joint venture between the Mayime agricultural co-operation representing some 285



Shiloh Irrigation Scheme (Photo taken by Jas Wasserman)



Shiloh Irrigation Scheme (Photo taken by Jas Wasserman)

direct and a further 1 200 indirect beneficiaries from Whittlesea near Queenstown. The project is still in its infancy, having produced and sent the first milk harvest in 2011. The project is on some 400 ha of irrigated land of which 300 ha are for dairy farming. The farm is milking about 850 cows.

Future Producers Project

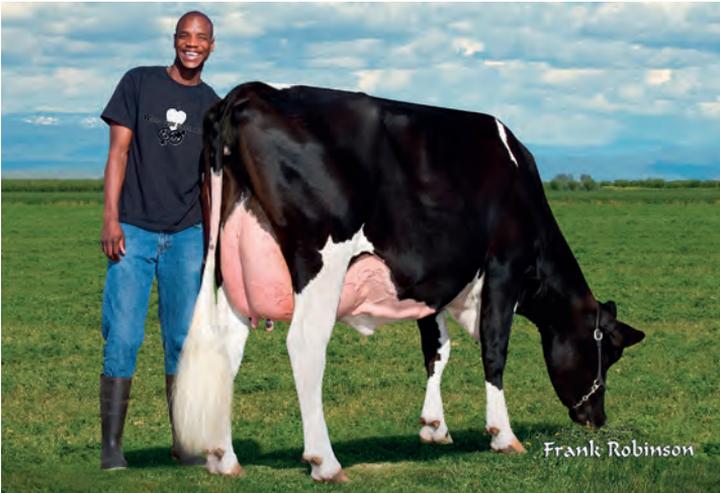
Judy Stuart invested her own money in this project that has created more than a dozen skilled farm managers capable of owning and running their own farms. She shut down her profitable dairy farm to kick-start the project.



Future Farmers Foundation
(Photo courtesy of the Future Farmers Foundation)

Future Producers is an apprenticeship project for ambitious youths from impoverished families without the means to pursue a tertiary education. Stuart encouraged other producers in the province to mentor the trainees on their farms for two years. After the mentorship programme, the trainees are selected for further training on farms in Australia, Europe and the US, funded by the Underberg Producers Association and Saville Foundation.

Future Farmers Foundation
(Photos courtesy of the Future Farmers Foundation)



Training includes driving tractors, operating milking machines, controlling irrigation systems, dairy herd management and basic accounting.

One of her former trainees, Sifiso Ntshisa, who worked on a farm in Germany, now manages one of the top dairy farms in the province, which boasts about 100 cows. Several other trainees are working on large dairy farms in California and on pig and sheep farms in Australia.

Grasslands Development Trust

The Grasslands Development Trust has been running in the Tsitsikamma in the Eastern Cape for quite some time and is benefiting all its investors.

Well-known milk producer Trevor Elliot helped to establish the trust on the trust's Schoonfontein dairy farm. It benefits 49 current and retired employees of Grasslands, represented by a board of trustees.

The trust bought Schoonfontein with funds from the Land Redistribution for Agricultural Development (LRAD) programme, which contributed 35% of the cost of the farm through grants. The other 65% was covered by a loan from Standard Bank.

The share-milking contract between Grasslands Agriculture and the Trust is based on the New Zealand model. The trust owns all the fixed assets,



while Grasslands owns the movable assets and runs the farm with Johan Maritz as farm manager.

Schoonfontein is a high-production dairy farm and, together with their share milker, the trust built a milking shed, renovated pastures, built water troughs, upgraded laneways and built seven houses for employees.

Since occupying the farm on 1 May 2004 and milking since October 2004, Schoonfontein has reached commercial success and BEE recognition. In 2005, the Grasslands Development Trust and Grasslands were voted BEE deal of the Year by The Business Map Foundation.

The farm has increased its milking herd from 650 in 2004 to 828 cows in December 2007. The project was so successful that the trust could afford to reduce the bank loan by R1 million and pay beneficiaries dividends of R15 000 each in 2005 and 2006.

Apart from financial empowerment, the Grasslands Development Trust has made extensive training available to its beneficiaries and their spouses. Additional training included life skills, HIV/Aids awareness, money management and basic business skills.

Rebokrant Dairy Development Trust

Rebokrant is a 1 000 ha farm in the Eastern Cape near Humansdorp that operates a profitable share milk scheme through cooperation between white commercial milk producers and black farm workers. The farm employs 20 people. The Department of Land Affairs offered farm workers the opportunity to apply for a grant in exchange for a workable business plan. Commercial milk producers in the Humansdorp area saw this as an opportunity to encourage their workers to enter the dairy farming sector.

Some 99 workers decided to take part in the Rebokrant venture who are all still employed as farm workers (with their respective commercial producer employers) and receive their salaries as well as dividends from the share milk scheme as an extra income. Their employers are all producers in the area who serve on the Dairy Trust, which helped to formulate the business plan. The workers are represented on the Workers' Trust.



Rebokrant Dairy Development Trust (Photo taken by Liza Bohlmann)

Rebokrant Dairy Development Trust (Photos taken by Liza Bohlmann)



The workers successfully applied for grants and each received R45 000. Some R4,5 million was supplemented by Dairy Trust members, who each took out a loan of R100 000 to add to the financial strength of the trust. After the acquisition of the farm, it was upgraded with infrastructure, fences and drinking troughs and a complete modern dairy was built. Each of the commercial producers on the Dairy Trust supplied good-quality dairy cows to Rebokant.

The ownership of Rebokrant (the share milk scheme) is shared by the Workers' Trust (52%) and the Dairy Trust (48%). The land and fixed assets are the property of the Workers' Trust, while the cows and movable assets belong to the Dairy Trust.

The Dairy Trust is responsible for managing the farm and reports to the Workers' Trust. No important decisions, such as buying new stock or building a new dairy, are made without the consent of the Worker's Trust.

Since the middle of 2007, the farm has started showing a profit. The income from milk sales are used to pay off the loans for setting up the dairy. The share milk scheme is so successful that they had to build a second 40-point milk parlour and increase cooling tank capacity. They are also paying off their debts, which will save money in the long run. The project will soon start to pay dividends in real terms. The future financial security

that the scheme presents, will see the R45 000 investments (grants) that the workers made growing into a valuable share in a profitable business.

Elim Dairy

Elim is a community town (missionary station) outside Bredasdorp in the Western Cape. The

farm covers 6 000 ha and belongs to the Moravian Mission Church. The dairy project started in 2007 with funds from the Western Cape Department of Agriculture, and cows were donated by the Outeniqua Research Farm. A manager and four other workers are permanently employed and about 150 cows are in milk. The dairy project

Elim Dairy (Photo by Helene Pheiffer)



Elim Dairy (Photo by Helene Pheiffer)



consists of the Elim Dairy Company with its own board of directors.

A technical committee of experts advises the Elim Dairy Company monthly. The IDT monitors the project. The mentor is also a member of the technical committee. Parmalat, the milk buyer, is also a member of the technical committee and is actively involved in the implementation of the long-term goals of the Elim Dairy project.

Coega Dairy

Established in 2010, Coega Dairy has had a positive economic effect in the Eastern Cape. The company is investing a significant amount and has created more than direct 350 and 750 indirect jobs. Ownership include Coega Milk Producers' Organisation (CMPO; 61,4% share),



Coega Dairy as published in *The Dairy Mail* Sep 2013

and Coega Empowerment Trust (CET; 38,6% share). CET includes Amadlelo Projects Trust (a black empowerment agri-business, with the purpose to train black farm managers through shared milk production), Coega Dairy Factory Workers Empowerment Trust, and Commercial Producers Empowerment Trust.

To build and expand its manufacturing capability and leverage opportunities in the supply chain, Famous Brands has entered into a ground-break-

ing, joint-venture partnership with Coega Dairy regarding the supply of cheese products to the group. Famous Brands will control 51% of Coega Dairy's shares, while shareholders of Coega Dairy will hold the balance of 49%.

Nestlé Agri-BEE: Maluti Window Project



Coega Dairy as published in *The Dairy Mail* Sep 2013



Nestlé supports emerging black producers in Harismith in the Free State, who previously worked as farm labourers and benefited from the land restitution programme initiated by government. The programme was started with a view to transform these emerging black producers to become commercially viable.



In partnership with other value-adding stakeholders, Nestlé is helping with providing basic facilities such as water supply, electricity and road infrastructure to enable the producers to compete in the market. Nestlé creates shared value by buying milk from these producers and helping them obtain funding, marketing opportunities, milk tanks, dairy infrastructure, milk transportation and vet services to ensure their herds are healthy and certified.

Nestlé's partners in this project are different government departments including the Independent

Development Trust, local and district municipalities, Departments of Agriculture and Public Works, Eskom and institutions of higher learning to provide training and development.

Parmalat



Parmalat established a fund at the end of 2006 to promote an active drive towards black economic empowerment (BEE) and food safety management systems (FSMS) compliance. The fund is administered by a joint committee between Parmalat and Samilco.

In line with their customers' requests to supply them not only with products of the highest quality and safety standards, but also with a satisfactory BEE rating, Parmalat's objective is to achieve a situation where a significant proportion of its suppliers will be actively involved with a BEE development plan for their individual enterprises.

To achieve this objective, Parmalat launched projects to make its suppliers aware of their BEE status and alternatives available to achieve a satisfactory level of compliance. Also, since 2007, Parmalat has paid a premium to suppliers who achieved a minimum of a 40% (level 7) compliance status.

Suppliers receive a once-off payment for every valid BEE certificate, which indicates a compliance of at least a level 7.

ANNEXURE A

Learning materials in the secondary dairy industry

1. Unit standards in the secondary dairy industry

1.1 Utility of unit standards

These learning materials are comprehensive and suitable for self-study as well as facilitated studying (tutoring, practical coaching and formative – phased, internal – assessor conducted or self-conducted assessment). It contains all the required theoretical content and practical guidance, the latter without attempting to rewrite operational manuals or standard work procedures. It ranges from generic to highly specific. Elaborate assessment tools for both the theoretical and/or practical components are supplied. Learners enrolled for these may obtain credits for successful completion on the National Learner Record Database (NLRD).

Training in terms of National Unit Standards

In total 94 unit standards of dairy technical and related nature currently support the four dairy orientated qualifications in the further education and training (FET) stream of learning – being registered on National Qualification Framework levels 2, 3 and 4 – being the equivalent levels of grades 10, 11 and 12.

As a different route to the obtaining of a qualification, learners/workplace providers may opt for shorter learning interventions by way of skills programmes spread over a longer learning time. These skills programmes are collections of unit standards from the qualifications in logical clusters, which lead to employable skills sets.

These skills programmes may lead to qualifications. Certain collections of skills programmes, achieved by way of learning pathways, result in the obtaining of qualifications.

1.2 List of unit standards

Registration numbers and titles of unit standards on which SAQA registered dairy qualifications are based and for which comprehensive learning modules exist

Number	Title
120396	Collect bulk milk from the farm by means of a milk tanker.
120412	Demonstrate an understanding of dairy terminology, equipment and systems.
123348	Demonstrate an understanding of the functional components of milk
120245	Demonstrate an understanding of the nature of milk and its transformation into commercial dairy products.
336863	Homogenise a liquid dairy product.
336867	Pasteurise, thermise or vaccreate a liquid food product by means of a plate or tubular heat exchanger.
120413	Receive and store raw milk or cream in a silo at a milk reception facility.
336862	Separate liquids using a centrifugal separator.
336861	Standardise the fat content of a liquid dairy product.
120405	Clean and sanitise a fast moving consumer goods (FMCG) processing system using an automated cleaning in place (CIP) system.

- 120410 Clean and sanitise food manufacturing equipment and surfaces manually.
- 120404 Maintain personal hygiene, health and presentation in a food-handling environment.
- 120417 Understand the control of pests and waste materials as part of a food safety system.
- 120402 Demonstrate an understanding of introductory principles of chemistry and physics.
- 120235 Demonstrate an understanding of the concept of microbiology in a food-handling environment.
- 119801 Demonstrate an understanding of microbiological principles and its application in a food-handling environment.
- 120416 Apply personal safety practices in a food or sensitive consumer product environment.
- 336799 Demonstrate an understanding of heating and cooling media in a food-manufacturing environment.
- 120403 Apply good manufacturing practices as part of a food safety system.
- 120407 Evaluate the quality of raw milk in terms of its antibiotics content.
- 120400 Evaluate the quality of milk in terms of its solids non-fat content.
- 120408 Evaluate the quality of milk in terms of its freezing point.
- 123282 Evaluate the quality of cheese in terms of its salt content.
- 336864 Evaluate the quality of a fruit juice, fruit juice concentrate or fruit-milk mixture, as indicated by its brix acid ratio.
- 123277 Evaluate the quality of a food product in terms of its total solids content using an oven drying method.
- 120397 Evaluate the quality of a food product in terms of its titratable acidity.
- 123284 Evaluate the quality of a food product in terms of its fat content as determined by an ether extraction method.
- 123294 Evaluate the quality of a food product in terms of its brix value.
- 120241 Evaluate the quality of a dairy product in terms of its fat content as determined by the Gerber or Babcock fat determination method.
- 123275 Evaluate the quality of a dairy powder in terms of its moisture content, as indicated by the toluene distillation method.
- 123276 Evaluate the fat, salt, moisture and solids non-fat content of butter as indicated by the Kohman test.
- 336866 Evaluate the composition of raw milk using an infrared or ultrasound analyser.
- 123272 Prepare glassware and media for analytical procedures in a laboratory.
- 120398 Measure the temperature of food products and evaluate the readings.
- 120401 Take a representative food sample.
- 120395 Evaluate the quality of raw milk in terms of its microbial load, as indicated by the resazurin test.
- 123299 Evaluate the microbiological quality of food products by means of pour plate methods.
- 123281 Evaluate the microbiological quality of a food product, as indicated by the presence of the pathogens. *Staphylococcus aureus* (*S. aureus*) and Salmonella.
- 120418 Evaluate the quality of milk in terms of its protein stability as indicated by the alizarol test.
- 123291 Evaluate the quality of instant milk powder in terms of its dispersibility.
- 123280 Evaluate the quality of a food product in terms of its viscosity.
- 120411 Evaluate the quality of a food product in terms of its pH.
- 123279 Evaluate the quality of a dairy powder in terms of the amount of scorched particles.
- 123296 Evaluate the sensory quality of condensed milk products.
- 123287 Evaluate the sensory quality of cheese.
- 123283 Evaluate the sensory quality of butter.
- 123278 Evaluate the quality of a dairy powder in terms of its solubility.

- 123292 Evaluate the quality of a dairy powder in terms of its bulk density.
- 123285 Evaluate the extent of saturation of butterfat (in cream or butter) as indicated by its iodine value.
- 120236 Evaluate the efficiency of homogenisation of a liquid dairy product.
- 120243 Evaluate the efficiency of milk or cream pasteurisation, as indicated by the phosphatase test.
- 123346 Manufacture butter with a continuous butter-making machine.
- 123293 Manufacture butter by means of a batch churn.
- 123358 Manufacture a mozzarella-type cheese from coagulated milk.
- 123311 Manufacture gouda- or grana-type cheese from coagulated milk.
- 123354 Manufacture a cheddar-type cheese from coagulated milk.
- 123303 Demonstrate an understanding of the connection between milk constituents, syneresis and moisture control in cheese curd.
- 123308 Perform controlled lactose crystallisation in sweetened condensed milk or concentrated whey.
- 123349 Evaporate a liquid food product using a falling or rising film evaporator.
- 123313 Manufacture smooth or chunky cottage cheese from coagulated milk.
- 123356 Manufacture a spray dried food powder from an evaporated mixture.
- 123355 Manufacture a dry food product by means of a roller dryer.
- 123307 Coagulate milk or a dairy mixture for the manufacturing of a fermented product.
- 123304 Mould a frozen dairy ice-cream or ice-cream-related product.
- 8880 Manufacture wafer products.
- 123297 Manufacture a frozen dairy ice cream or ice-cream-related product.
- 8875 Enrobe confectionery products.
- 123351 Manufacture processed cheese.
- 123350 Manufacture a sterilised food product by means of a steri-tower.
- 123309 Manufacture a sterilised food product by means of a retort.
- 123310 Manufacture a UHT food product.
- 336839 Collate and shrink-wrap packaged products using automated wrapping equipment.
- 123298 Operate and control the wrapping and sealing of individual food product units.
- 123301 Operate and control the individual wrapping of process cheese portions.
- 336859 Operate and control the forming, filling and hermetic sealing of plastic sachets or bags for food products.
- 336860 Operate and control the forming, filling and hermetic sealing of gable top or brick type cartons for food products.
- 123347 Operate and control the forming and wrapping of a brick or cube shaped food product.
- 123312 Operate and control the filling and sealing of cans for food products.
- 336865 Operate and control the filling and closing of glass or rigid plastic containers for food products.
- 123306 Operate and control the aseptic forming, filling and sealing of containers for food products.
- 120239 Monitor critical control points (CCPs) as an integral part of a hazard analysis critical control point (HACCP) system.
- 123357 Conduct a hazard analysis critical control point (HACCP) study in a food-handling environment.
- 119796 Monitor and control quality assurance procedures in a food or sensitive consumer product environment.
- 119802 Perform quality-control practices in a food or sensitive consumer product operation.
- 123300 Evaluate the sensory quality of process cheese.
- 336879 Evaluate the sensory quality of pasteurised milk, cream or fruit-milk mixtures.
- 123289 Evaluate the sensory quality of liquid long life dairy products.

123290	Evaluate the sensory quality of frozen dairy ice-cream or ice-cream-related products.
123305	Evaluate the sensory quality of fermented dairy products.
123288	Evaluate the sensory quality of dried dairy products.
123286	Evaluate the sensory quality of cottage cheese products.
123353	Prepare a bulk starter culture for the manufacturing of fermented dairy products or cheese.
123274	Evaluate the activity of a starter culture in terms of its pH or % titratable acidity.

2. In-company coaching manuals for the secondary dairy industry

2.1 Utility of coaching manuals

These learning materials are abridged in format and elaborately supplied with visual content, for the illiterate, semi-literate to fully literate learners. The target group may range from general workers and cleaners to machine attendants, to system operators and manufacturing assistants. No written theory testing is required (though if the learner so prefers, it may be conducted) and prompting questions during practical observation of performance is recommended, for which performance checklists are supplied. Mentors take full responsibility for declaring learners competent. Sampro does the certification. No credits can be achieved on the NLRD, but these in-company interventions are suitable (and accepted) for insertion on workplace skills plans (WSPs) for mandatory grant purposes.

2.2 List of coaching manuals

Arrangement of in-company coaching manuals in various programmes (abridged format manuals).

Programme 1

Manual 1
Manual 2
Manual 3
Manual 4
Manual 5
Manual 6
Manual 7
Manual 8

Good manufacturing practices.

Personal hygiene of people working in a food manufacturing environment.
Hand washing.
General behaviour in a food manufacturing environment.
Good house-keeping in a processing and packaging area.
Good house-keeping in a food and packaging material store.
General safety.
Safety signs and symbols.
More safety requirements and actions in case of an emergency.

Programme 2

Manual 1
Manual 2
Manual 3
Manual 4
Manual 5
Manual 6
Manual 7

Cleaning and sanitising.

The role of micro-organisms.
Cleaning and sanitising.
Manual cleaning and sanitising.
Cleaning in place (CIP) and wash programmes.
Start-up checks and actions for CIP.
Running an automated CIP system.
CIP of a pasteurising system.

Programme 3

Manual 1
Manual 2
Manual 3
Manual 4

Raw milk reception.

Sampling milk.
Preparations for sampling raw milk in a tanker.
Sampling raw milk in a tanker.
Temperature measurement.

Manual 5	Perform the alizarol test and the boiling test.
Manual 6	Equipment at milk reception and milk storage.
Manual 7	Procedure for the intake of milk from a road tanker.
Manual 8	Washing the tanker.

Programme 4

Milk testing.

Manual 1	Determination of the % titratable acidity.
Manual 2	Determination of the pH of milk products.
Manual 3	Determination of % butterfat in milk by means of the Gerber test.
Manual 4	Performing the resazurin test on raw milk.
Manual 5	Determination of the freezing point of milk.
Manual 6	Determination of the solids non fat of milk.

Programme 5

Pasteurisation system.

Manual 1	Purpose and principles of the pasteurisation system.
Manual 2	Operating the pasteuriser.
Manual 3	Fat separation.
Manual 4	Homogenisation.

Programme 6

General processing requirements.

Manual 1	General pre-start-up requirements.
Manual 2	General start-up requirements.
Manual 3	General checks required during processing or packaging.
Manual 4	General shut-down and cleaning checks or requirements.

Programme 7

Bulk milk collection.

Manual 1	General requirements when bulk milk is collected on a farm.
Manual 2	Sampling raw milk from the bulk tank.
Manual 3	Temperature determination.
Manual 4	Alizarol test on bulk milk.
Manual 5	Volume determination.
Manual 6	Pumping the milk from the bulk tank into the tanker.

Programme 8

Manufacturing assistance.

Specialisation: Hard and semi-hard cheese manufacturing.

Manual 1	Overview of the cheese manufacturing process.
Manual 2	The cheese manufacturing equipment.
Manual 3	The curd manufacturing process in the cheese vat.
Manual 4	The cheddaring process.
Manual 5	Block forming and pressing cheddar cheese.
Manual 6	Packaging, ripening and storage of cheese blocks.
Manual 7	Manufacturing of gouda-type cheese.
Manual 8	Ripening, storage and dispatching gouda-type cheese.
Manual 9	Mozzarella-type cheese.
Manual 10	Feta-type cheese.

Specialisation: Evaporation and spray drying.

Manual 11	Overview of the evaporation and spray drying processes.
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Manual 12	Giving assistance to the evaporator operator.
Manual 13	Preparing the spray drier for production.
Manual 14	Giving assistance to the spray drier operator during production.
Manual 15	Packing and storing milk powder.

Specialisation: Mixing and blending.

Manual 16	An introduction to mixing or blending food products.
Manual 17	Prepare for mixing dry ingredients.
Manual 18	Weighing and blending dry ingredients.
Manual 19	Blending liquid products.

Specialisation: Yoghurt manufacturing.

Manual 20	Overview of yoghurt manufacturing.
Manual 21	Procedures preceding inoculation.
Manual 22	Inoculation, incubation and intermediate treatment and additions.
Manual 23	Packaging (plastic tubs, jugs and cups).
Manual 24	Shrink wrapping.
Manual 25	Cold storage.

Specialisation: Cottage cheese manufacturing.

Manual 26	Overview of the cottage cheese manufacturing process.
Manual 27	Cottage cheese manufacturing equipment.
Manual 28	Pre-treatments, additions to cottage cheese milk and coagulation.
Manual 29	Curd handling for the manufacturing of chunky cottage cheese.
Manual 30	Curd handling for the manufacturing of smooth cottage cheese.
Manual 31	Preparation and addition of dressing during cottage cheese manufacturing.
Manual 32	Packaging, cold storage and dispatch of cottage cheese.

3. Posters in the secondary dairy industry

3.1 Utility of posters

Posters depicting processes or concepts (mostly on a single page, but sometimes on multiple pages), highlighting the main activities or exemplars, may be used as learning aid with the unit standard-based modules or the in-company coaching manuals. It may also be effectively used as singular learning aid (without printed text), as well as exhibited at or near the workstation (where such activity is conducted) as reminder learning aid.

3.2 List of posters

List of posters of technical nature (for use in conjunction with either the comprehensive, unit standard supporting modules or in-company coaching manuals, as training aid, or for display at the workstation).

123278	Evaluate the quality of a dairy powder in terms of its solubility.
123292	Evaluate the quality of a dairy powder in terms of its bulk density.
120257	Homogenise a liquid dairy product.
120234	Pasteurise, thermise or vaccreate a liquid food product by means of a plate or tubular heat exchanger.
120413	Receive and store raw milk or cream in a silo at a milk reception facility.

- 120259 Separate liquids using a centrifugal separator.
- 120255 Standardise the fat content of a liquid dairy product.
- 120405 (X3) Clean and sanitise a fast-moving consumer goods (FMCG) processing system using an automated cleaning in place (CIP) system.
- 120416 Apply personal safety practices in a food or sensitive consumer product environment.
- 120242 Demonstrate an understanding of heating and cooling media in a food-manufacturing environment.
- 120407 Evaluate the quality of raw milk in terms of its antibiotics content.
- 120400 Evaluate the quality of milk in terms of its solids non-fat content.
- 120408 Evaluate the quality of milk in terms of its freezing point.
- 123282 Evaluate the quality of cheese in terms of its salt content.
- 120244 Evaluate the quality of a fruit juice, fruit juice concentrate or fruit-milk mixture, as indicated by its brix acid ratio.
- 123277 (X2) Evaluate the quality of a food product in terms of its total solids content using an oven drying method.
- 120397 Evaluate the quality of a food product in terms of its titratable acidity.
- 123284 Evaluate the quality of a food product in terms of its fat content as determined by an ether extraction method.
- 123294 Evaluate the quality of a food product in terms of its brix value.
- 120241 Evaluate the quality of a dairy product in terms of its fat content as determined by the Gerber or Babcock fat determination method.
- 123275 Evaluate the quality of a dairy powder in terms of its moisture content, as indicated by the toluene distillation method.
- 123276 Evaluate the fat, salt, moisture- and solids non fat content of butter as indicated by the Kohman test.
- 120237 Evaluate the composition of raw milk as determined by an infra-red analyser.
- 120401 Take a representative food sample.
- 120395 Evaluate the quality of raw milk in terms of its microbial load, as indicated by the resazurin test.
- 123299 Evaluate the microbiological quality of food products by means of pour plate methods.
- 120418 Evaluate the quality of milk in terms of its protein stability as indicated by the alizarol test.
- 120410 Clean and sanitise food manufacturing equipment and surfaces manually.
- 120404 Maintain personal hygiene, health and presentation in a food-handling environment.
- 120243 Evaluate the efficiency of milk or cream pasteurisation, as indicated by the phosphatase test.
- 123346 Manufacture butter with a continuous butter-making machine.
- 120233 Operate and control the filling and closing of glass or rigid plastic containers for food products.
- 123358 Manufacture a mozzarella-type cheese from coagulated milk.
- 123311 Manufacture a gouda- or grana-type cheese from coagulated milk.
- 123354 Manufacture a cheddar-type cheese from coagulated milk.
- 123349 Evaporate a liquid food product using a falling or rising film evaporator.
- 123313 Manufacture smooth or chunky cottage cheese from coagulated milk.
- 120411 Evaluate the quality of a food product in terms of its pH.
- 123279 Evaluate the quality of a dairy powder in terms of the amount of scorched particles.
- 123351 Manufacture processed cheese.
- 123350 Manufacture a sterilised food product by means of a steri-tower.
- 123309 Manufacture a sterilised food product by means of a retort.
- 123310 Manufacture a UHT food product.

120238	Collate and shrink-wrap packaged products using automated wrapping equipment.
123298	Operate and control the wrapping and sealing of individual food product units.
123301	Operate and control the individual wrapping of process cheese portions.
120256	Operate and control the forming, filling and hermetic sealing of plastic sachets or bags for food products.
120258	Operate and control the forming, filling and hermetic sealing of gable top or brick type cartons for food products.
123347	Operate and control the forming and wrapping of a brick or cube shaped food product.
123312	Operate and control the filling and sealing of cans for food products.
123272	Prepare glassware and media for analytical procedures in a laboratory.
120398	Measure the temperature of food products and evaluate the readings.
123300	Evaluate the sensory quality of process cheese.
123356	Manufacture a spray dried food powder from an evaporated mixture.

4. Dairy qualifications and skills programmes:

National Certificate in Milk and Cream Handling and Storing, NQF2
Identification (NLRD) number 74229, minimum 120 credits.

National Certificate in Dairy Primary Processing, NQF3
Identification (NLRD) number 74250, minimum 120 credits.

National Certificate in Food Laboratory Analysis, NQF3
Identification (NLRD) number 50305, minimum 130 credits.

Further Education and Training Certificate in Dairy Manufacturing Technology, NQF4
Identification (NLRD) number 50306; minimum 120 credits.

5. Skills programmes:

SP1:	Introductory Dairy Analytical Procedures
SP2:	Health, hygiene, safety and GMP
SP3:	Intermediate dairy analytical procedures
SP4:	Introductory dairy technology
SP5:	Advanced dairy analytical procedures
SP6:	Primary dairy processing
SP7:	Safety in dairy processing and quality assurance
SP8:	Dairy product specialised analyses
SP9:	Manufacture ripened cheese
SP10:	Manufacture cottage cheese
SP11:	Manufacture processed cheese
SP12:	Manufacture fermented dairy products
SP13:	Manufacture condensed milk products
SP14:	Manufacture dried dairy products
SP15:	Manufacture liquid long-life dairy products
SP16:	Manufacture butter and related products
SP17:	Manufacture frozen ice-cream or related products

ANNEXURE B

Training courses of the Institute for Dairy Technology

1. Accreditation for the following learnerships

Code	Description	Credits
48970	National Certificate: Animal Production (NQF 1)	120
48976	National Certificate: Animal Production (NQF 2)	120
49048	National Certificate: Animal Production (NQF 3)	120

2. Skills programmes based on accredited unit standards skills programmes

	US NO
Dairy production	
Apply basic dairy production practices	US 116207
Explain basic dairy husbandry practices	US 116120
Explain dairy production cleanliness	US 116110
Artificial insemination	
Identify basic breeding practices for farm animals	US 116107
Apply basic artificial insemination practices	US 116215
Occupational health and safety and code of good practice for dairy production	
Utilise health and safety principles in livestock en dairy production	US 119447
Apply health and safety in livestock and dairy production and processing	US 123172
Animal husbandry	
Care for farm animals	US 12587
Observe and handle animals	US 116197
Livestock handling I	
Observe and handle animals	US 116197
Administer livestock processing treatments	US 116643
Observe and inspect animal health	US 116074
Livestock handling II	
Explain the prevention and treatment of animal diseases	US 116219
Determine feedlot mass	US 116637
Implement animal health and bio-security	US 116308
Socio-economic empowerment	
Identify, discuss, describe and compare major economic systems with emphasis on the SA economy.	US 13996

Demonstrate an understanding of agricultural production management practices in relation to the social-economic environment (productivity).
Plan and manage personal finance.

US 13357
US 15092

Tractor maintenance

Utilise and perform minor repair and maintenance tasks on implements, equipment and infrastructure.
Drive a tractor.

US 116060
US 116820

The framework of the Dairy Occupational Qualification for the Dairy Farm Worker, Dairy Farm Supervisor and Dairy Farm Manager is as follows:

Knowledge subjects (Dairy farm supervisor and herd manager)

Dairy farming environment
Dairy calf rearing, feeding and health care
Dairy animal health care
Dairy animal production
Dairy livestock feeding
Milk harvesting and in-parlour processing
Team leadership
Dairy farm production management
Farm business management

Practical skill modules (Dairy farm worker, dairy farm supervisor and herd manager)

Perform calf rearing, production and health care practices
Perform animal production and health care practices of heifers, cows and bulls
Prepare feed and feed cows in milk
Harvest milk, attend to milk parlour hygiene and equipment
Attend to dairy parlour water treatment and waste water
Lead and direct work teams
Initiate and maintain first line discipline
Keep dairy farm records
Attend to dairy herd management activities
Attend to milk parlour management activities
Attend to farm business management activities

Work experience modules (Dairy farm worker, dairy farm supervisor and herd manager)

Calf rearing practices and a dairy farm
Heifer, cow and bull production and health care practices on a dairy farm.
Lactating cow production feeding on a dairy farm
Milk harvesting, parlour hygiene and equipment care processes on a dairy farm.

In-parlour milk processing and handling
 Directing a work team in different dairy farming production activities
 Dairy farm records and administrative processes
 Dairy farming management processes and systems

Break down of the knowledge subjects

Module 1: South African dairy farming environment

Introduction to the South African dairy industry

Career opportunities in the dairy industry
 Commercial dairy farming
 Emerging farmers and opportunities
 Risks in dairy farming
 The dairy industry value chain

Dairy breeds

Holstein-Friesland
 Jersey
 Guernsey
 Ayrshire
 Dairy Swiss
 Dual purpose breeds
 Cross-breeds
 Choosing a breed

Basic dairy farming business concepts

Understanding management
 Understanding money matters and costs
 Understanding marketing
 Understanding machines and equipment
 Understanding manpower
 Understanding of production material and resources
 Understanding the value of livestock
 Understanding productivity and profitability
 Understanding production cycles

Module 2: Dairy calf and heifer rearing, feeding and health care

Introduction to dairy calf and heifer health care

Developmental time scale of calves and replacement heifers
 Care of calving and the new-born calf (vitality, colostrum, navel disinfection)
 Importance of healthy calves and heifers in terms of productive herds
 Visual appearance of a healthy calf
 Factors that affect calf health
 Importance of colostrum and passive immunity
 Vaccination programs (active immunity) for dairy calves and heifers
 Types of vaccines, storage and handling of vaccines (maintenance of the cold chain)
 Internal parasite control

Calf rearing systems	<ul style="list-style-type: none"> External parasite control Separation of calves with disease and quarantine principles Bio-security of calf-rearing facilities Permanent housing Movable pens Calf camps for group rearing Deep litter systems
Hygiene and Care	<ul style="list-style-type: none"> Importance of hygiene Daily inspection practices including critical inspection points Factors affecting hygiene Cleaning and disinfecting chemicals and equipment Signs of poor hygiene Fly control Water drainage and moisture control Personal hygiene and protective clothing
Calf feeding concepts	<ul style="list-style-type: none"> Handling and feeding of colostrum Handling and preparing milk and milk substitutes for feeding Milk feeding risks (mastitis, milk containing residues such as antibiotics) Basic nutritional requirements of dairy calves and heifers at various ages Importance of roughage and concentrates at various ages Milk feeding schedules of dairy calves Feeding schedules for calves and heifers Water and water quality needs Cleaning and disinfection of feeding equipment Weaning of calves
Awareness of dairy calf diseases	<ul style="list-style-type: none"> Causes of diarrhoea by viral diseases including rota, corona Causes of diarrhoea by bacterial diseases including <i>E.coli</i>, <i>Salmonella spp.</i> Causes of diarrhoea by protozoal diseases (coccidiosis) Nutritional induced diarrhoea First response treatments for diarrhoea Causes of other diseases such as pneumonia, eye infections, navel infections, calf diphtheria
Calf and heifer care and production concepts	Calf and heifer handling and restraining

Module 3: Dairy animal health care

Diagrammatic illustrations and basic functions of the anatomical systems

Identification, marking and branding
Removal of accessory teats
Dehorning
Castration

General dairy livestock health

Body parts of livestock
Main organs of livestock
The ruminant digestive system
The udder
The reproduction system
The immune system
The respiratory system
The circulatory system
The urinary system
The nervous system
The muscular and skeletal system
The skin

Awareness of causes of disease in dairy animals

Importance of healthy herd in terms of productive herds
Visual appearance of a healthy animal
Factors that affect animal health
Immunity and vaccination programs
Types of vaccines
Cold chain requirements (storage and handling)
Separation of livestock with disease
Risks of poor application practices (abscess forming)
Adverse drug reactions

Viral diseases (e.g. lumpy skin disease, Rift Valley fever, three-day stiffness, enzootic bovine leukosis)
Bacterial diseases (e.g. anthrax, brucellosis, black quarter, pasteurellosis, etritis, mastitis, tuberculosis)
Toxins (e.g. botulism)
Fungal diseases (e.g. ring worm)
Protozoal diseases (e.g. red water)
Rickettsial diseases (e.g. heart water, anaplasmosis)
Nutritional causes (e.g. acidosis, bloat, mycotoxicosis)
Metabolic diseases (e.g. milk fever, ketosis)
Injury and trauma
Poisoning (e.g. urea, lead, plant poisoning, algae poisoning)

Health assessment
Dry cow health assessment

Parasites and basic lifecycles
Farm bio-security and risk prevention
(including zoonotic diseases)

Module 4: Dairy animal production

Animal herding and handling practices

Dairy animal breeding concepts

Water supply systems on dairy farms

Fencing on a dairy farm

Module 5: Dairy livestock feeding

Dairy feed types and feeding

Fresh cow health assessment

Defining bio-security
Zoonotic diseases (e.g. brucellosis, tuberculosis, rabies, Rift Valley fever)
Disposal of dead animals
Quarantine
Movement control (access control, vehicles, people and livestock)

Dairy animal welfare and treatment practices
Herding of dairy livestock
Restraining dairy livestock
Dairy livestock loading and transport
Dairy livestock handling and holding facilities
Common facility problems
Stress factors
Shade and cooling

Reproduction planning and goals
Breeding practices (natural breeding, breeding seasons, artificial breeding)
Male breeding behaviour
Basic concepts of infertility and venereal diseases
Oestrous cycle and signs of oestrous
Birth and after birth process
Gestation stages and period
Herd composition
Replacement heifers
Dairy animal condition assessment

The water requirements of dairy cattle
Water troughs and distribution
Water quality

Fencing material
Fence construction

Different feed types and feeding practices
Feeding concentrates (flat rate, step rates)
Total mix rations (TMR)
Feed additives
Supplementary feeding and licks
Natural grazing

	<ul style="list-style-type: none"> Cultivated pastures and grazing practices (strips, camps, continuous grazing) Silage making Hay making
Feeding of heifers practices	<ul style="list-style-type: none"> Feeding programs for heifers Heifer growth targets
Feeding of cows in milk	<ul style="list-style-type: none"> Feeding concepts and the importance of correct lactation curve (early, mid, late and dry period) Metabolic problems of cows in milk
Feeding of dry cows	<ul style="list-style-type: none"> Purpose of the dry period Feeding during the dry period (far away and close up phase) Feeding of first calf heifers Prevention of metabolic problems
Feeding facilities and equipment	<ul style="list-style-type: none"> Feed storage facilities Feed mixing and distribution equipment Feed troughs Housing systems Drinking systems and water quality

Module 6: Milk harvesting and in-parlour processing

Milk harvesting facilities	<ul style="list-style-type: none"> Location of the milking parlour Layout of the milking parlour (herringbone, rotary, tandem) Basic equipment of the milking parlour Layout and specifications of holding pens and walk ways
Udder health	<ul style="list-style-type: none"> The healthy udder Common udder abnormalities Udder hygiene Mastitis (causes, diagnosis, treatment and prevention)
The milk harvesting process	<ul style="list-style-type: none"> Cow handling and milking order Milk let-down reflex Pre-milking cow preparation Milking process (hand, bucket and machine) Post milking cow care Handling of contaminated milk and colostrum
Dairy parlour equipment and systems	<ul style="list-style-type: none"> Milking equipment (components, care and maintenance) Vacuum pump (components, care and maintenance)

	<ul style="list-style-type: none"> Milk cooling equipment (components, care and maintenance) Bulk storage equipment (components, care and maintenance) Milk pump, valves and pipes (components, care and maintenance) Milk flow recording systems Inline wash system Wastewater treatment systems Standby power generator (care and maintenance)
Dairy parlour hygiene	<ul style="list-style-type: none"> Personal hygiene and protective clothing Parlour hygiene Equipment hygiene Milk parlour environment hygiene Foot baths Ablution facility hygiene Vermin control
Essential production records	<ul style="list-style-type: none"> Importance of good record keeping Parlour records Individual cow records Insemination records Health register General diary Cow and heifer calendars
Composition of milk and quality indicators	<ul style="list-style-type: none"> Composition of milk Factors influencing milk composition and quality Quality indicators including somatic cell counts, bacterial counts, milk urea nitrogen (MUN), butter fat %, protein % and lactose %
In-parlour processing and quality control concepts	<ul style="list-style-type: none"> Cold chain requirements and bulk tank management Improvement of shelf life Milk safety for human consumption Milk quality tests at dispatch
Module 7: Team leadership	
Introductory supervision concepts	<ul style="list-style-type: none"> The function of the supervisor in terms of planning, organising, directing and controlling The use of standard workplace practices and procedures to direct work process Business ethics and values
Performance standards concepts	<ul style="list-style-type: none"> Setting performance goals Formulating clear instructions

	<ul style="list-style-type: none"> Controlling stands of performance Correcting poor performance The use of coaching to address performance problems Delegation in the workplace
Motivation and team leadership concepts	<ul style="list-style-type: none"> Basic principles of motivation The dynamics of work teams Effective team communication
Inter-personal relations	<ul style="list-style-type: none"> Developing effective work relations Gaining respect Workplace discrimination
First line discipline	<ul style="list-style-type: none"> The supervisors role in maintaining workplace discipline Concept of fairness Disciplinary codes and procedures Sources of conflict and resolving conflict in the workplace Dealing with difficult people Disciplinary records
Work efficiency and effectiveness	<ul style="list-style-type: none"> The supervisors role in productivity Daily activity planning Organising and prioritising time Using a diary
Module 8: Dairy farm production management	
Dairy farm design concepts	<ul style="list-style-type: none"> Dairy parlour design and equipment specifications Waste disposal design Bio-security facilities design (quarantine camps; access control) Animal housing and feeding facilities design Animal handling facilities design Storage facilities design Infrastructure design (roads and verges, storm water drainages, wind breaks) Pasture design
Dairy animal breeding	<ul style="list-style-type: none"> Breeding management systems (AI and natural) AI programme and equipment management Breeding policy (breed standards; best linear unbiased prediction [BLUP]) Breeding and herd improvement principles Computer based breeding programmes Value of milk recording information regarding breeding
Dairy animal nutrition	<ul style="list-style-type: none"> Basic principles of feeds and feeding

Dairy animal health management

Procurement, quality and stock control
 Animal nutrition management according to production
 Fodder flow programme management
 The role and importance of the animal nutritionist as part of the management team
 Computer based nutrition programmes
 Value of milk recording information regarding feeding

Basic principles of animal health management
 The role and importance of the veterinarian as part of the management team
 Procurement, quality and stock control of vaccines, drugs, medication and supplements
 The importance of an animal health and bio-security programmes
 Computer-based animal health programmes
 Value of milk recording information regarding animal health

Module 9: Farm business management

Farm business management

Farm management structure (organogram)
 Dairy farm industry (marketing and consumer trends)
 Organising, directing and controlling concepts
 Decision making and problem solving
 Planning and scheduling
 Productivity and continuous improvement
 Quality management (global GAP or good agricultural practice)

Farm labour management

Industrial relations (unions)
 Farm code of conduct and disciplinary procedures
 Performance management systems
 Contracts and job descriptions
 Health and safety management
 Personnel development (induction, training, coaching and mentoring)
 Employment wellness (HIV and Aids)
 The role and importance of the labour consultant as part of the management team

Financial and stock management

Financial terms and accounting concepts
 Budgeting concepts (forecasting stock needs and required order quantities)
 Cost management (production cost and cost of stock)

Natural resource management

Introductory overview of dairy farming related legislation

Basic principles of financial reports
Stock management (storage of stock on hand, reordering levels and stock flow concepts)
Computer-based financial and stock management programmes
The role and importance of the financial advisor as part of the management team

Ecological cycles
Water conservation
Waste management
Natural disaster management

Employment legislation (statutes and regulatory requirements)
Occupational Health and Safety Act (OHSA)
Environmental legislation
Agricultural products standards Act (Act 119 of 1990)
Health Act 61 of 2003 (regulation 1256, regulation 918)
Foodstuffs, cosmetics and disinfectant Act (Act 54 of 1972) regulation R1555
SANS 1841; trade metrology Act (Act 77 of 1973)
Value added tax Act (VAT) No. 89 of 1991- part B - zero rates
Livestock protection Act
Livestock identification Act
Fire Act



ANNEXURE C

Courses offered by the ARC (in the primary and secondary dairy industries)

- Dairy products manufacturing.
- The use of breeding values in dairy cattle breeding.
- Identify the need for capital and understand the need for the recording of the income and different costs in an agri-business.
- Apply husbandry practices to farm animals.
- Handle and move farm animals.
- Demonstrate an understanding of healthy farm animals.
- Apply standard animal feeding procedures.
- Recognize basic breeding behaviour of farm animals.
- Small-scale dairy production.

ANNEXURE D

Agri skills transfer courses (in the primary dairy industry)

- National Certificate: Animal Production NQF Level 1-4 over 10 months.
- National Diploma: Animal Production NQF Level 5 over two years.
- Animal courses that includes starting an animal production enterprise, feeding, rearing of young, housing, etc - Short course.
- Animal Health courses – Short course.

ANNEXURE E

Courses offered by FMCG Training Solutions (in the secondary dairy industry)

National certificates:

- National Certificate: Milk and Cream Handling and Storing.
- National Certificate: Dairy Primary Processing.
- National Certificate: Food Laboratory Analysis.
- Further Education and Training Certificate: Dairy Manufacturing Technology.

Skills training:

- Advanced dairy analytical procedures
- Analyse and evaluate the quality of raw milk for intake at milk reception
- Analyse and evaluate the quality of raw milk or cream.
- Basic introduction dairy course. NQF2
- Bulk milk tanker driver skills programme NQF 2
- Collect, receive and store raw milk or cream.
- Health, hygiene, safety and good manufacturing practices
- Intermediate dairy analytical procedures
- Introductory dairy analytical procedures
- Milk reception at a dairy. NQF3
- NQF 2 Fundamental's skills programme
- Operator skills programme: gable top or brick type carton filler operator skills programme
- Operator skills programme: glass/rigid plastic container filler operator skills programme
- Operator skills programme: sachet filler operator skills programme
- Primary dairy processing

