The Milk SA guide to dairy farming in South Africa

DAIRY FARMING IN SOUTH AFRICA
Message from

MILK SA

Dear reader

Milk is an essential part of many farming enterprises, big and small. For commercial farmers milk is an important source of income, while for many smaller farmers it mainly serves to feed the household and to generate an additional income. Whatever the case may be, milk needs to be of the best quality possible.

This publication is an introduction to the best practices and basic principles of running a dairy parlour. However, it is by no means the complete authority on what it takes to be a successful milk producer.

Milk South Africa trusts that this book and its contents will contribute to the promotion of our dairy industry and more particularly, to support our new dairy entrepreneurs in becoming successful partners of the industry.

May you find pleasure and value in working through this publication!

Regards,
The Board of Directors
Milk South Africa
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1.1 Introduction to the South African dairy industry

Milk production is an essential part of many farming enterprises. In South Africa it is the fifth largest agricultural industry. Milk is produced every day and gives a regular income to the numerous small and large producers. Milk production is very labour-intensive and provides employment to many people. Highly sophisticated equipment is used for milking and therefore skilled and well-trained workers are essential. Great commitment is needed because cows must be milked at least twice a day, throughout the year.

Although there are fewer dairy farmers in South Africa than before, they still produce well because they have enlarged their herds and use the most advanced technology. They understand that dairy farming is a business and needs to be operated with the relevant business skills. Knowledge of dairy cattle and their management is necessary, as well as providing the cow in milk with the kind of nutrition that will allow it to produce the optimum amount of quality milk. Milk can be used to make an enormous variety of high-quality products. The high cost of milk as a raw material has demanded a high-technology processing industry. Strict and wide-ranging quality regulation and high transport costs can be expected because of milk being perishable and bulky.
A. Commercial and non-commercial dairy farmers

Commercial dairy farmers
Commercial farming is when the main purpose is to sell and/or add value to agricultural products, such as milk, for profit. Choices about what or how much to produce are determined by the market, not by the needs of the farmers and their families. The scale of operations is large, the milk is produced in large quantities and is sold in bulk to large dairy processors, and sold for export purposes as well.

With commercial dairy farming one has to keep in mind that success in the dairy market depends on various factors. Commercial dairy farming is not simply “a way of life”; it is a business, and without the relevant business skills, a dairy enterprise cannot be sustainable.

Non-commercial dairy farmers
A non-commercial dairy farmer, being an emerging, small-scale, communal or subsistence farmer, is a producer who cannot produce milk to the market on a continuous basis. To become a successful dairy farmer, it requires hard work and you have to develop several technical and managerial skills.

Although the Department of Agriculture, Forestry and Fisheries (DAFF) and Milk SA have already spent a great deal of effort on empowering emerging dairy farmers, there are still various challenges.
• Emerging farmers can no longer start with only 5 cows in their backyards as a sustainable dairy farm now needs at least about 100 cows to survive and start being profitable.
• The high intensity of milk production and risk factors such as milk quality and safety are major barriers to entry for emerging farmers.
• Dairy farming requires specialised knowledge in numerous disciplines such as animal health, feeding, calf rearing, etc. Therefore, besides sufficient financial resources, non-commercial dairy farmers also need access to mentorship and training.

Communal/subsistence farming is when the main purpose of the farmer is to produce food and other agricultural products, such as milk, to meet the needs of the farming family. The milk can also be traded with others for products that are not grown or made on the farm. Very little money is spent or earned in a subsistence farming enterprise, and the purpose is not to become a commercial dairy farmer.

When the produced milk is consumed or used by an individual farmer or his family, or sold or exchanged amongst a small group, it is known as subsistence or communal dairy farming.

Milking one’s own cows provides a cheap source of high-quality food for the home, and families also benefit from a better diet if milk is included.
Excess milk (after satisfying the requirements of the home) can be sold to neighbours or passers-by. The sale of milk can result in a useful income. Milking a few cows by hand will not require any additional labour. The number of cows kept will depend largely on the available feed as well as on the number of cows the farmer can milk by hand.
B. Dairy industry value chain

Milk production in South Africa is dominated by two types of producers: large-scale commercial producers, and small to medium-sized commercial producers.

**INPUTS**

**DIRECT INPUTS**
- Seed
- Fertiliser
- Water
- Feed
- Electricity
- Animal health products
- Farming/dairy equipment

**SUPPORT INPUTS**
- Finance
- Animal health, production and reproduction info and technology
- Training

**PRODUCER (DAIRY FARMER)**

**INFRASTRUCTURE/CAPITAL INVESTMENT**
- Dairy cattle
- Milking parlour
- Milking machines
- Cooling facilities
- Silage bunkers
- Housing/sheds
- Fencing
- Irrigation system
- Workers

Consumer
Large-scale commercial producers sell milk to dairy processors. Small and medium-sized producers sell most of their milk directly to consumers and/or to processors. Dairy processors buy milk from producers to produce dairy products for distribution to retailers, exports and for further processing.
C. Opportunities and risks in dairy farming

It is generally accepted that success in the dairy market depends on various factors, including:
- quality products
- sound management
- transparent industry information

Since deregulation (1997) the number of smaller milk producers have declined, mainly because marketing/control boards no longer offered a supporting role to milk producers, and production and marketing became more competitive. Due to economies of scale, processors have amended their procurement patterns after deregulation and started buying less from smaller milk producers.

Some consumers like to buy fresh milk directly from producers, because the source of the milk, its quality and safety is known. Producers can also sell directly to small cafés and street vendors. In this way, some transaction costs can be cut and it will lead to higher profits. A sound relationship needs to be in place between the sellers and the buyers.

The high demand for value-added products, such as sour milk, yoghurt and cheese, is another market to be explored. However, to go this route would require high investment, market knowledge and the necessary training.

Within the dairy farming industry, there are many sources of uncertainty and risk. These include:
- Uncertain weather conditions that have an influence on the herd and the production of sufficient volumes of feed.
- Uncertain product prices or uncertain interest rates.
- Uncertainty with respect to market availability for products.
- Uncertainty about possible changes in regulations of governing production practices.
- Uncertainty about government policy to allow more imports, which can drive down local prices.
- Sudden outbreaks of contagious diseases.

However, a successful farmer can reduce the risks by proper planning and good management.
D. Buying a dairy farm

Buying a dairy farm is not a decision you should make without talking to many experts and considering various factors, because it involves investing a huge amount of money. Not only do you need enough money to buy the farm, you will also need money to maintain the dairy farming activities and furthermore to develop the farm in future.

People such as the neighbours, the veterinarian, the extension officer and the agricultural expert from your bank can give valuable information and advice. Ask for written records to prove claims about the positive features of the farm.

You should find out more about the following important factors:

- Availability of dependable electricity.
- Existing milk facilities and equipment.
- Distance of the farm to the nearest town.
- Existing milk route of milk-buying companies.
- Condition of the roads to the farm.
- Existing contract with a company that buys milk.
- Availability of sufficient water.
- Possibility of producing enough roughage.
- Existing pastures and types of soil.
1.2
Economy of dairy farming

A. Prepare a budget

You can draw up a monthly budget in five simple steps. If you have a personal income and an income from your farm, rather draw up a separate budget for each.

Step 1: Income
“Net income” means the amount of money that you take home after you have paid taxes and levies. Work out your net income by adding up all of your and your family’s sources of income.

Step 2: Fixed payments
Fixed payments are payments that you make every month. This may be an instalment on furniture, feed for your cow or school fees, and includes other things such as teat dip or vaccinations for your cows. Money set aside for savings is also a fixed payment.

Step 3: Day-to-day expenses
Day-to-day expenses are often not planned for and include money spent on veterinary services, phone calls, cooldrinks and groceries.

Step 4: Luxury payments
This is also known as non-essential payments. These are the things that you DO NOT have to spend any money on, for example beer and sweets. List these things, especially those things that you like to buy but cannot really afford.

Step 5: Personal budget
Use a blank page and put your total income right at the top. List your fixed payments, day-to-day expenses and luxury items. Add these three totals together to give you a total for expenses. Subtract your total expenses from your total income. The difference is what you have left every month. If the difference is a minus, you will have to look at reducing the amount that you spend or increasing your income. If you have money left, consider saving up a bigger amount for something that you really want to do, such as expanding your dairy.

Borrowing money
• Never borrow money if you do not have to.
• Borrow only for necessities.
• Pay the borrowed money back in instalments and do not miss a payment.
Chapter 1 The South African dairy farming environment

- Net income is all your and your family’s sources of income.

- Fixed payments are the things you have to pay for every month.

- Day-to-day expenses are not always planned for.

- Luxury payments are spent on things that you don’t really need.

- Do your budget on paper.
- Work out how much money you have left by subtracting all your expenses from your income.
B. Understand the dairy market

Before you can sell your milk, it is necessary that you understand some basic market principles. Once you understand these principles, you will be able to expand your milk sales with confidence.

The production of milk follows a process that basically consists of four steps:
- Rearing animals (feeding, breeding and caring for them).
- Producing (milking your cows).
- Collecting, chilling and bulking (transporting your milk to the collection centre or to your customers or collection of milk on your farm).
- Marketing (the sale of your milk, directly to the public or to a buyer or cooperative).

Milk price
The price that you receive for your milk is known as the producer price. The price increases as it goes from the producer to the processor, collection centre or cooperative, wholesaler and ultimately, the consumer.

Profit
Profit is the money that you make from your milk. Profit is the difference between the cost of producing and transporting your milk, i.e. feed cost, animal health care, labour, etc, and the money from the milk sales.

Competitors
These are the other milk producers who also sell their milk in your region, and often to the same customers. Too many producers (competitors) in the market can put pressure on the milk price. Therefore it is good to become a member of a producer group or to join a cooperative.

Marketing
Marketing is a process that you follow to make people aware of your milk. You can market your milk by advertising. Ensure that your milk is of good quality. Creating a good reputation for your product will help ensure that your milk is always sold.
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- **Rearing**: Feed and care for your animals.

- **Production**: Milk your cow.

- **Marketing**: Sell your milk to a buyer, cooperative or shop.

- **Transportation**: Milk collection and delivery play a very important role in maintaining the cold chain.

- Competition is good.
- Join a group to protect your interests.
- Profit is the money that you make from your milk.
The Milk SA guide to dairy farming in South Africa

C. Sell your milk

Selling your milk means that you can earn extra income for your farm, but before you start selling, there are some important things that you have to consider.

- Make sure that there is a cooperative, shop, school, processor or even clinic that will buy your milk. In other words – list your possible customers.
- Find out what kind of packaging your customer would prefer. Some might wish for milk to be delivered in plastic bottles, while others may have their own containers and will only require delivery in a can.
- Be sure that you are equipped to deliver the milk. The shop or collection centre should not be too far from your farm.
- Be sure that you are able to deliver cool milk. Your customer will not want warm milk that will go sour quickly.
- If a buyer or processor collects milk from your farm, make sure that your access roads are good and your reception area is up to standard.

Testing

Once you start selling your milk to a collection centre, you will have to agree to the testing of your milk. A centre will not buy milk if they are not sure that the milk is hygienic. If you are selling to a shop or to the community, it is your duty to supply safe, clean, fresh and hygienic milk.

Your own abilities

- Do your own market research.
- Determine who your clients are.
- Can you deliver the milk?
- Can you cool the milk?
Chapter 1 The South African dairy farming environment

Quality
• Find out what type of packaging your clients prefer.
• Sanitise and clean all the bottles and containers that you use.

Marketing
• Advertising is the best way to market your milk.

Records
• Keep good record of your finances.
1.3 Buying cattle for dairy farming

A. Various breeds of cattle

In South Africa at least seven breeds of cattle are recognised as being "dairy breeds". These breeds are known for higher milk production and are suited to intensive milk production systems, such as parlour equipment, cow housing and concentrate feeding. These are Holstein-Friesian, Jersey, Guernsey, Ayrshire, SA Dairy-Swiss, Brown Swiss and Dairy Shorthorn. Other breeds, such as Simmenthaler, Flechvieh and South Devon, are occasionally seen in the milking parlour.

Choosing a dairy breed can be a difficult decision. However, if you know which breed suits your needs, you will be able to choose and buy the right breed.

**Holstein**
The Holstein is the most popular dairy breed across the world and in South Africa. It is white and black in colour and is a big animal (large-framed). These animals are exceptionally high milk producers and can be culled and marketed as meat. The Holstein sometimes has difficulty calving and is not suited for walking long distances. Its milk has a low butterfat content. Holsteins are not as heat-resistant as some other dairy breeds.

**Jersey**
Jerseys are smaller than other dairy breeds and are very popular in South Africa. They are light-brown in colour and are known for their good udders and calving ease. Their milk has a high butterfat and protein content. Jerseys adapt well to warmer areas. Because of their smaller size, they eat less and are good grazers.

**Ayrshire**
The Ayrshire is slightly smaller than the Holstein and can also be culled for meat. It is white and red-brown, and produces milk that has a high butterfat content. Its milk is especially suited as drinking milk. Ayrshires can function in cold and warm climates. It is known for its good udder.

**Guernsey**
The Guernsey is light red-brown and white. It calves with ease and its milk also has a high...
buttermilk content. The Guernsey is slightly larger than a Jersey, but smaller than a Holstein. The Guernsey adapts well to almost any climate and is known for its good temperament and well-attached udder.

**Dairy Swiss**
The Dairy Swiss can adapt to different climates and is known for its good fertility and high life expectancy. It also calves easily and produces milk with a high protein content. Its milk is especially suited for cheese production. The Dairy Swiss is a large animal and its coat has various shades of brown, with a white muzzle and ears.
Swedish Red
The Swedish Red is red-brown with white markings. It is a medium-sized, high-producing animal and its milk has a high fat and protein content. The Swedish Red adapts well to both hot and cold climates. It is known for its high production figures, low somatic cell counts and profitability.

Dual-purpose breeds
The dual-purpose breeds look like the beef breeds in shape – heavy, short-legged and fairly wide – but produce more milk with a higher butterfat content than typical beef cattle.

The common breeds of dual-purpose cattle in South Africa are the following: Devon, Dairy Shorthorn, Brown-Swiss and Simmenthaler.

Dual-purpose breeds are good for milk and meat production. Milk production is lower than with the specialised dairy breeds. Feeding and management requirements for dual-purpose breeds are lower.

Cross-breeds
A cross-breed usually refers to an animal with pure-bred parents of two different breeds.

In certain pasture-based production systems, farmers prefer smaller cows with lower feed requirements. For this purpose they use Jersey-Holstein cross-breed cows.
Chapter 1 The South African dairy farming environment

Devon

Shorthorn

Brown-Swiss

Simmenthaler

Jersey-Holstein cross-breed
B. Factors to consider when buying cattle

When you decide to buy cattle for your dairy farm, you have to choose the right breed to farm with. There are many dairy breeds available, but choosing one will depend on your needs.

**Economy:** Choose a breed that will give you the income and profit that you need. Base your choice on three very important things: the highest quality milk; the highest quantity of milk (high production); the lowest possible cost.

**Area:** Choose a breed that is available in your area. If you have to transport your cattle over a long distance, it can cost you a lot of money. Transporting animals can also cause injury.

**Climate:** Some breeds perform best in hot areas, while others perform better in cooler areas.

**Feeding:** Before buying cattle, be sure of the feeding system that you can provide for your cattle. Some farms are suitable for zero grazing systems, while others are more suitable for grazing systems. Some breeds are more suited to grazing than others.

**Volume:** Decide whether you want to produce a large amount of milk (high volume), or whether you would prefer milk with a higher butterfat or protein content. These factors are very important when you start selling milk to a milk buyer. Some buyers prefer milk with a high butterfat content, as this milk is used to make cheese and other dairy products.

**Learn from your neighbour:** If other farmers are farming successfully with a certain breed of cattle in your area, then you should probably follow their example. Do not try to farm with a breed that has not been proven successful in your vicinity.

**Heifers or cows?**

If you decide to buy heifers, always buy from a good breeder who will give you all the information you will need. Ask for the records and milk production figures. Buy only healthy animals that are certified as TB- or brucellosis-free. Your heifers should replace your old cows, so buy accordingly.

Heifers are easier to transport and adapt to their new environment quickly. They are usually also cheaper than cows, but produce less milk during their first lactation.

By buying a cow that adapts to your farm quickly, you will be sure of a good income because the cow will start producing immediately. However, older cows may have mastitis and damaged teats. Take great care when buying an older cow.
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- Talk to your successful neighbouring farmer for advice.
C. Selection criteria for cattle

Now that you know what to look for and which breed will suit your farm best, it is time to choose the cows or heifers that you want to buy. This process is called selection and is done by looking at six basic factors. These factors all determine the “dairyness” of a milk cow – in other words, the things that make her look like a dairy cow.

**Milk production**
Select a cow that produces a high volume of milk. Ask for its production records. Do not buy a cow that is too old, as it may have mastitis and may be in its last lactation, which means that you will only be able to milk it for one lactation.

**Butterfat and protein**
Your milk buyer will determine the price of your milk on the basis of the protein and butterfat content of the milk. Ask for its milk records to check for these percentages.

**Hooves and legs**
Do not buy an animal that is limping. Watch how it walks and inspect the hooves. Inspect the heels – if the heels are damaged, then the animal has a weak pastern (the area above the front of the hoof) and cannot walk long distances. An expert will be able to look at the shape of the hind legs, to tell you whether the animal can walk long distances.

**Udders**
The udder is the most important part of the cow that you MUST examine before buying it. The udder must be soft and slightly warm. It should not be lumpy and should never hang below the hock (“knee”). It should be slightly pink in colour.

**Body capacity**
The animal should be able to digest enough food, in order to produce enough milk. The body should be “deep” and “long”, with well-sprung ribs, so that there is enough space for the rumen and digestive system. Also look at the muzzle and teeth. The muzzle should be broad and strong, and there should be no abscesses in the mouth, as this will make chewing difficult. Also look at the forelegs. There should be enough space for the important organs, such as the heart and lungs.

**Temperament**
Do not buy a cow that appears to be very nervous. A dairy cow should stand still while being milked. It should be easy to handle. Also avoid buying a cow that is either too timid or too aggressive.
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Records of production, butterfat and protein

Body capacity

Temperament

Hooves and legs

Udder

Muzzle and teeth

![Diagram of cow with various parts highlighted and notes on health and care.](image)
D. Biosecurity principles on a dairy farm

Biosecurity, which refers to the protection of health through the avoidance of disease, is becoming increasingly important to the dairy sector. Good biosecurity, which literally means “safe life”, plays an important role and has many advantages on a dairy farm.

The advantages of having a good working biosecurity programme include:
- Prevention of the spread of disease, on the farm and among animals on the farm.
- Improved animal welfare, by keeping more animals healthy.
- Early identification of disease once it appears on the farm.
- Reduction of costs of disease prevention and treatment.
- Protection of the food supply safety – ensures high-quality, safe products.
- Peace of mind, healthy stock and a more viable business.

For any of these advantages to be achievable, a farm worker must understand how diseases spread.
- Direct transfer of disease occurs when one animal transmits it to another, e.g. nasal discharges.
- Indirect transfer happens when equipment or other objects, contaminated with the disease-causing organism, carries the disease to an animal. Examples of disease-carrying objects are boots, overalls, needles, syringes, obstetrical chains, tractors and loaders.

Disease in dairy cattle and other bovine animals can be spread through various mediums, including:
- Diseased cattle or healthy cattle incubating disease.
- Other animals, such as farm animals, pets, wild birds and other wild life, vermin and insects.
- Clothing and shoes of visitors and employees moving from farm to farm.
- Contaminated farm equipment and vehicles.
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- Contaminated feed, water, bedding and soil.
- Carcasses of dead animals.
- Airborne particles and dust blown by the wind.

Biosecurity is critical to all farms, and with the increasing spread of highly infectious diseases it should be taken very seriously. Dairy farm workers must realise that they provide the first line of defence in keeping dairy cows healthy and content.

Dairy farm workers have an important role to play in preventing the spread of disease and must pay attention to the following:

- Keep all farm equipment, such as tractors, trucks and vehicles that enter and leave the farm, clean, because they can carry disease from farm to farm if not cleaned between deliveries.
- Help enforce risk-reducing farm rules that restrict access to certain areas.
- Clean and sanitise small equipment, such as hoof-trimming tools and calving chains. Start by scrubbing the tools with a brush to clean off all dirt and debris, otherwise the disinfectants will not be effective.
- Clean clothes should be worn to work daily – wash it in the hottest water possible and tumble-dry if you can.
- Ensure that boots and shoes are clean and dirt-free. Disinfect footwear when moving from one pen to another, especially after working in pens with sick animals.
- Frequently wash your hands in the proper way.
- Be aware of visitors and inform your supervisor of strangers on the farm. Ask visitors to report to the office or to the owner.
- Feed-storage areas must be kept clean. Clean before you restock and destroy all contaminated feed.
- Repair fences immediately to keep wildlife and other people’s animals out.
**Successful biosecurity has some basic elements:**

**Cleaning and sanitation**
- Routinely clean and disinfect buildings, barns, equipment, vehicles, clothing and footwear.
- Implement the use of foot- and wheelbaths.
- Promptly dispose of dead animals.
- Avoid borrowing equipment and vehicles from other farms.
- Implement a manure management programme.

**Nutrition**
- Clean out and disinfect feed and water troughs regularly and ensure that water troughs are always full of water.
- Remove feed that is not eaten and dispose of it responsibly.
- Clean and sanitise feed-storage facilities routinely.

- Clean water and feed troughs regularly.
- Supply footbaths for visitors.
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Isolation
- Erect good fences and secure gates to prevent livestock from mixing with livestock from other areas.
- Keep different age and production groups in different camps.
- New animals should be isolated. If they are ill, they must be treated immediately.
- Milk cows with mastitis last and disinfect the parlour after use.
- Isolate sick animals from the rest of the herd and treat them immediately.

Herd health management
- Monitor the herd’s health daily.
- The local veterinarian or extension officer can assist with a yearly vaccination programme, which will protect your cows from disease and infection.
- Identify all animals with proper ear tags for traceability.
- Immediately report any sign of illness to your supervisor, veterinarian or extension officer.

• Keep all newly acquired animals separate and look for signs of illness.
The message is simple:

- Disease may not always be obvious, especially in its early stages.
- Be clean, particularly when handling animals or moving between different premises.
- A good biosecurity routine is always essential – not just when there is a disease outbreak.

- Follow a vaccination programme.
- Provide clean, healthy food.