

WOOL

IN SOUTH AFRICA



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Wool in South Africa
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"HI GUYS, I'M MR MALUSI,
JOIN ME ON A JOURNEY THROUGH
THE WONDERFUL WORLD OF
WOOL . . . C'MON, IF YOU
SNOOZE, YOU LOSE !"





A shearer harvesting wool from a sheep

Wool is a natural fibre because it grows on sheep. The process of getting wool from sheep is called shearing. The people who do this are called shearers.

After wool has been shorn it can be made into many different products. After it has been shorn it also grows again.

Wool shorn of a sheep is called a fleece. Good dictionaries will tell you the word fleece means "the wool coat of a sheep".

Wool is wonderfully...

- **insulating** (keeps you warm in the cold and cool in the heat)
- **fire retardant** (doesn't burn easily)
- **lightweight**
- **water repelling** (drives water and moisture away before absorbing it)
- **strong**
- **soft**



Wool keeps us warm in the cold

Now you understand why humans have been using it for thousands of years for clothing, textiles, furnishings and insulation.

When conditions are extreme and space is limited wool is the perfect fibre for clothing. It is therefore worn by astronauts in space, sailors who navigate the oceans, polar scientists and people who strike oil in sub-zero temperatures in Alaska. They all rely on wool products for warmth and protection.

Though it is ancient as a fibre, it is also perfect for space travel, bundu-bashing, climbing Mount Everest or simply wearing around the house.

(Text partially adapted from the International Wool Textile Organisation, I.W.T.O.)



The wool fleece looks like this when it is growing on the sheep

WOOL IS COOL!



WOW WOOL

Wool fibres can bend 30 000 times without breaking or becoming damaged. It can be stretched up to one third of its length and then spring back into place. It can also absorb a considerable amount of moisture without feeling wet, which makes it ideal for sportswear.



WHAT IS WOOL?

Wool is a natural fibre grown by sheep to form a protective **fleece** that covers most of their body. The fleece is shorter around the face, legs and belly, but longer and softer across the back and sides of the body.

This woollen fleece protects sheep from the weather. It keeps them warm during winter and cool during summer. Wool also protects the sheep's skin against sunburn.

Wool fibres are made of **protein**, with a small amount of fat, **calcium** and **sodium**.

As wool grows out from the sheep's skin, it naturally forms into groups of fibres called **staples**. Wool fibres are not straight: they grow with a natural crimp (wave), which gives wool its elasticity (springiness).

HOW DOES WOOL GROW?

Continuously, which means non-stop. Each wool fibre grows outwards from the sheep's skin.

A fleece can be shorn off each year. It will then regrow until the next **shearing**.

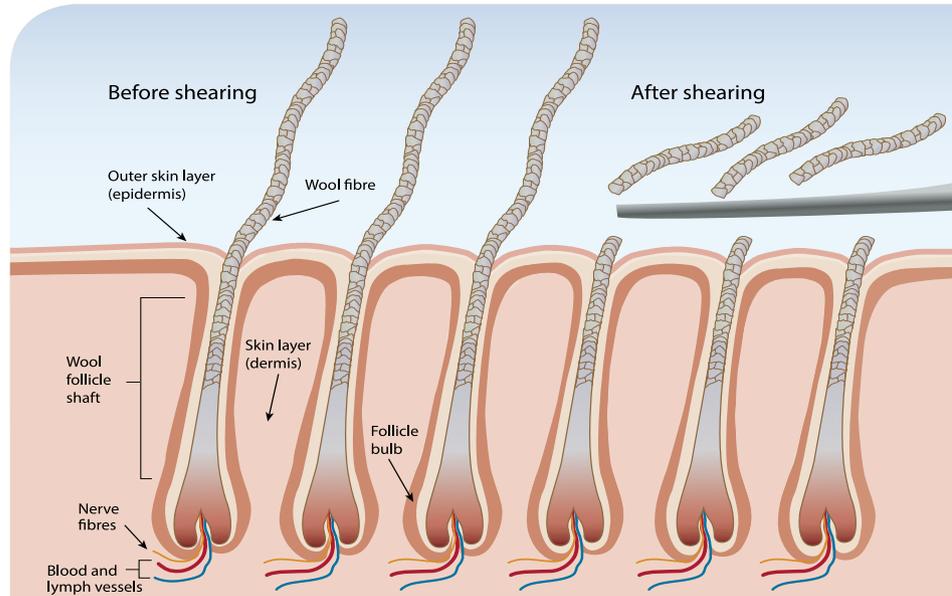
Wool grows between 6 mm and 10 mm per month, but this varies depending on breed, nutrition and **environment**.

WHAT DOES WOOL FEEL LIKE?

It feels soft and slightly oily before it is washed or processed.

The natural oil in wool (lanolin) coats each fibre and helps to insulate the fleece. It is the lanolin which makes the wool water resistant.

This helps to keep sheep warm during cold weather and dry when it is wet.



How a wool fibre grows from the sheep's skin

Wool fibres have a natural crimp (wave)



WOW WOOL

Wool grows about 6 mm in a month. Age, health and even the climate can slow growth down, or hurry hairy matters up.

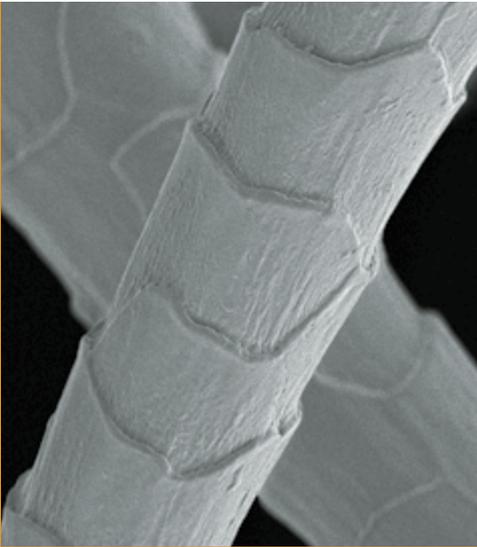
WHAT DOES WOOL LOOK LIKE?

The wool produced on most South African properties is a creamy white colour.

As the wool grows, the outer ends of the fibres obviously become dirty. Luckily the wool closer to the skin stays bright and white, or creamy.

When long fleece is carefully parted to reveal the groups of fibres (which are called staples) the crimp (wave) of the staples is clearly visible.

Some sheep grow wool in shades of brown and black.



Under a microscope wool looks scaly



Wool fibres form groups called staples



Some sheep grow coloured wool



Wool removed from a sheep is called a fleece

WOW WOOL



An average Merino wether can produce up to 4,5 kg of wool each year.



Wool regrows after shearing



THE SOURCE

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USE THIS FLOW CHART TO FIND
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AND IF YOU DON'T UNDERSTAND
 A WORD LOOK FOR IT IN THE
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WHERE DOES WOOL COME FROM? ...

Wool grows on sheep, one of the first **animals** to be **domesticated**. People in Western Asia kept sheep as far back as 12 000 years ago, but mainly for meat and milk. These animals looked more like goats than sheep. They seemed more hairy and less woolly than the sheep breeds we know today. Over time people have selected the best sheep to breed. This selection resulted in more and better quality wool. As a result, a breed like the modern Merino produces large quantities of high-quality wool.

Anybody can farm with sheep. In South Africa wool farmers range from small scale to large **commercial** farmers. Most commercial family farms run **flocks** of one to two thousand sheep, but there are also very large producers with many more sheep.

Wool farmers make an income from the sale of both wool and meat. In some countries sheep are milked to make cheese, but this is rare in South Africa.

Most of the wool produced in South Africa is produced by free-ranging sheep on natural grazing which is either grassveld, Karoo veld or a blend of both. Wool farms are situated from the semi-arid Karoo to the grassveld of the summer rainfall areas. In the winter rainfall area (the coastal belt of the Western Cape) sheep are farmed on **cultivated pastures** and crop **residues**.



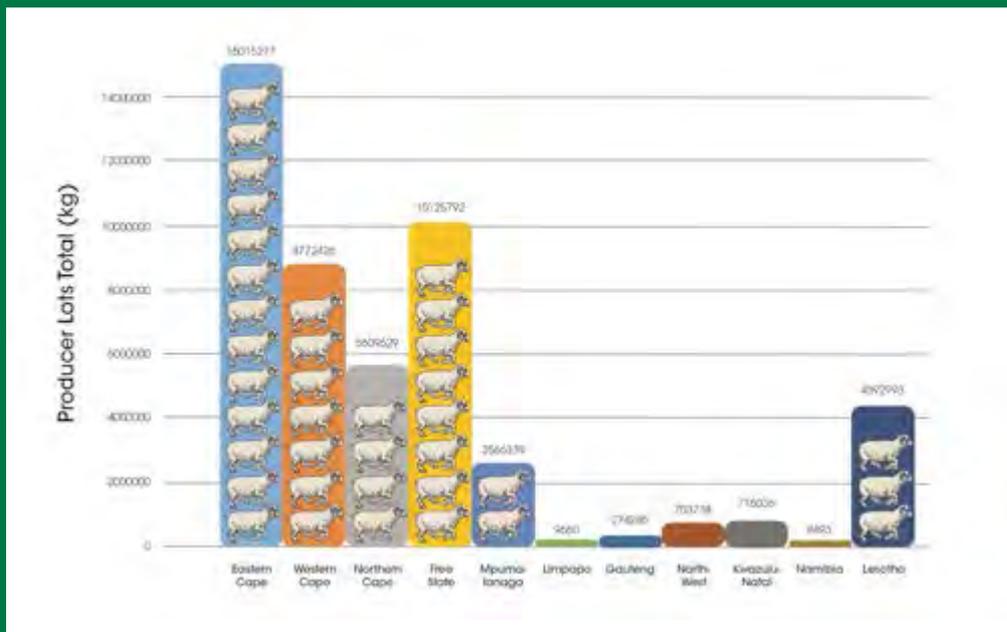
SHEEPY STATS

South Africa has about 22 million sheep, of which approximately 70% are woolled sheep. By far the majority of these are Merinos. Merino is a breed of sheep. Other South African breeds include SA Mutton Merino, Dohne Merino, Afrino and Dormer.

WHERE IN SOUTH AFRICA DO WE FIND SHEEP?

Sheep are found all over the country. The Eastern Cape has the highest number of sheep, followed by the Free State, Western Cape and Northern Cape. A fair number of sheep is also found in Mpumalanga.

The graph below shows wool production per province.



Wool production (kg) per province (2012/2013)



Mature Rams

THE ABC OF A SHEEP FLOCK

Different words describe sheep of different sexes and ages. Wool production relies mostly on adult sheep, but younger sheep and breeding stock form an equally important part of the flock on most wool producing properties.

Lambs – Young sheep (male and female) under 6 months of age. Lambs are still dependent on their mothers for food.

Weaners – Young sheep (male and female) recently removed from their mothers to feed on grazing. In the absence of mother’s milk their only source of food is grazing.

Hoggets – Immature male and female sheep. They are older than weaners but not yet fully-grown adult sheep.

Ewes – Mature females that can breed and produce wool.

Rams – Mature males that have not been castrated and are used for breeding.

Wethers – Mature males that have been castrated so they cannot breed. They are used for wool production.



Lucky

SCHUCKS SHEEP!



Lucky was the world’s oldest sheep. Lucky succumbed to the effects of a heat wave in Australia and died peacefully after a short illness in November 2009. She was 29, twice the life expectancy of a sheep. The previous record for longevity was held by George, a Merino wether, also from Australia. George died in his sleep in 2006. He was 21. Both Lucky and George were kept as pets, and recognized by the Guinness World Records for being the oldest living sheep.

SHEEP BREEDS

Sheep breeds in South Africa suit different production environments and these different breeds fulfil different human needs. Separate breeds deliver either fibre or meat.

All specialised wool breeds also yield income from the sale of meat.

Let's take as example two breeds, like the SA Mutton Merino and the Suffolk. The SA Mutton Merino Breed produces medium wool, used for making clothes and textiles. The Suffolk delivers coarse wool, also called carpet wool.

MERINO

In South Africa about three-quarters of the sheep population are wool sheep and the vast majority of these are Merinos, or breeds derived from the Merino.

The story of how the first Merinos settled here (South Africa was the first country outside of Europe to obtain Merinos) is very dramatic.

The original sheep breed in South Africa was the indigenous fat tailed sheep like the Namaqua. In the 16th century the Namaqua sheep was described by a voyager to the Cape as "very big with very good meat. They have have no wool on their backs and have great tails".

Some of these indigenous sheep were shipped to Australia in 1788 to provide the early Australian settlers with meat.



What is a species and what is a breed?

SPECIES: A group of animals (or plants) with the same characteristics. They can mate (propagate, in the case of plants) to produce fertile offspring. Sheep are a species.

BREED: A group within a species with common ancestors. They can be distinguished from other groups within that species. Merino and Border Leicester are two different sheep breeds.



Merino ewes



Sassy Shepherd

A Griqua shepherd boy picked up a huge diamond (46,69 carats) in the Kimberley district in 1869. He sold it to a local farmer for 500 sheep, 10 oxen and 1 horse. At the time it was the largest diamond ever to be found in South Africa and became known as the Star of South Africa. It has changed hands many times since then. In 1974 it was sold on auction in Switzerland for 1.6 million Swiss Francs (more than R17 million).



SILENCE OF THE SHEEP



Hundreds of years ago Spain held a monopoly on the finest wool in the world. They did not allow any of their Spanish Merinos to leave Spain until the late 1700's!

WOOL WEIGHT

The first Merino's produced about 1,5 kg of wool per fleece. **Selective breeding** has produced sheep that can grow a fleece of more than 8 kg.

OTHER WOOL BREEDS

A number of new breeds – of which the Dohne Merino is the most important – were developed in South Africa. Was there anything wrong with existing breeds? No, they simply didn't suit our production environments.

The **Dohne Merino** was created by mating SA Mutton Merino rams with Merino ewes. The result was a dual purpose breed able to produce both wool and meat. It was originally developed at Dohne Research Farm near Stutterheim in the Eastern Cape, specifically for the grassveld of this region. This region has a higher carrying capacity than Karoo vegetation. Today the Dohne Merino is widely spread in South Africa and is even exported to Australia.

The **Afrino** was developed at Carnarvon Experimental Farm in the Karoo. The aim was to produce wool and meat in semi-arid regions. It combines wool production from Merinos and mutton production from SA Mutton Merinos with the hardiness of the Ronderib Afrikaner. The Ronderib Afrikaner originates from the

indigenous sheep kept by the Khoi pastoralists.

The **SA Mutton Merino** was originally imported from Germany as the German Mutton Merino. In South Africa it developed a separate identity as a meat breed which also produces good quality wool. It was therefore renamed the SA Mutton Merino.

The **Dorner** was developed at Elsenburg Agricultural College outside Stellenbosch in the Western Cape by crossing the British Dorset Horn breed with the SA Mutton Merino. (Do you see how the names of the two breeds are combined to make a new name?) It is a popular breed on winter pastures in the winter rainfall area.



SHEEPY SCIENCE

To create a new breed, two or three existing breeds are crossed. Selection for the desired characteristics is done in the offspring and after a few generations of selection and mating, you have a new breed. The new breed differs from the original breeds. It reproduces its characteristics in its offspring.



SA Mutton Merino



Dohne Merino



Dorner



Sheep eat plants like grass, legumes, hay, silage and grains

THE LONG AND THE SHORT OF IT

Sheep prefer to eat short grass, rather than long (rank) grass. They thrive on pasture shorter than 80 – 100 mm.

WHAT DO SHEEP EAT?

Sheep are herbivores. This means they feed only on plants. Their diet consists of grasses, shrubs, **legumes**, **hay**, **silage** and grains. They like grazing young and tender plants, but will also eat dry grass and hay.

Like all other animals sheep use their food as a source of nutrients to help them grow and stay healthy. They spend approximately seven hours a day grazing. This they do mostly during the early morning and early evening when it is cool and still light.

If the quality of the available food is not very high, they can spend up to twelve hours a day grazing and walking many kilometres.

When there is not much feed in a camp, farmers put out extra feed. This can be hay, grain or processed feed mixes that have been specially prepared to meet the sheeps' nutritional requirements.

WATER

Like people sheep need food as well as water to survive. They can drink up to 6 litres per day. The type of pasture and feed they eat, their size, time of year (summer or winter) and weather conditions influence their water intake.



Sheep need plenty of water to survive



Sheep can walk for hours grazing for food



Sometimes sheep need to be given extra feed

DIGESTION

Sheep are ruminants. This means they have four stomachs and chew **cud**. Each stomach has a different function during the digestion of food.

When sheep **graze** they eat quickly. They chew their food lightly, mixing it with saliva, and then swallow it into their rumen (first stomach). The rumen is like a storage bag. It contains digestive juices and millions of **microbes** that start breaking down the food.

This process produces a lot of gas. Sheep burp to get rid of it. Burping (releasing unwanted gases) prevents it from becoming **bloated**, and possibly dying. (When your mom tells you not to burp at the table, she is simply teaching you good manners. You're not a sheep and won't get harmed!)

About an hour after eating, muscles in the rumen push the food back up to the mouth to be chewed again as cud. Sheep often chew their cud when they are resting and not grazing.

They chew their cud to break the food down further, then swallow it a second time. The ground-up food passes into the reticulum (second stomach), which stores liquid, then into the omasum (third stomach) where folds of muscle catch the food and squeeze it to remove the liquid.

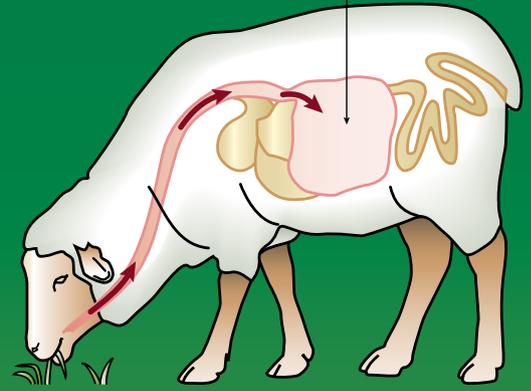
The food then moves to the abomasum (fourth stomach). Here it is mixed and again churned with digestive juices.

It then passes into the **intestine** where nutrients are absorbed into the bloodstream. The waste is excreted through the bowel.

What did the lamb say to its mum after dinner?

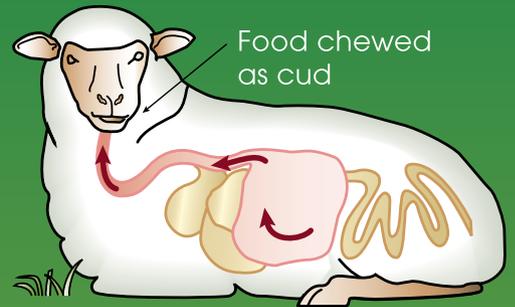
GRAZING

Rumen (1st stomach)



CHEWING CUD

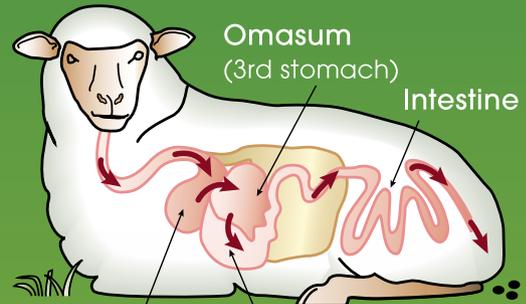
Food chewed as cud



FINAL DIGESTION

Omasum (3rd stomach)

Intestine



Reticulum (2nd stomach)

Abomasum (4th stomach)



FASCINATING FACT

Sheep are not the only ruminants. Cows, goats, giraffes, springbok, kudu, steenbok and eland are also ruminants.

Ruminants feed the microbes that convert plant material high in fibre, which humans cannot digest, into useful products such as meat and wool. Without sheep and cattle about nine-tenths of South Africa would be useful only for recreation or game farming.

You might not be a sheep but you can also "ruminant" . . . When you "ruminant" you are "chewing" a matter over in your mind and thinking deeply about it, probably for the second, third or fourth time. Next time someone asks you a trick question you can play for time by answering, "I'll first have to ruminant on that . . ."



REPRODUCTION

Reproduction is the process by which animals produce offspring. Rams are joined (mated) with ewes to produce lambs.

The ram's **sperm** passes into the reproductive tract of the ewe and fertilises an egg from the ewe's **ovary**. Hereafter a **foetus** forms in the

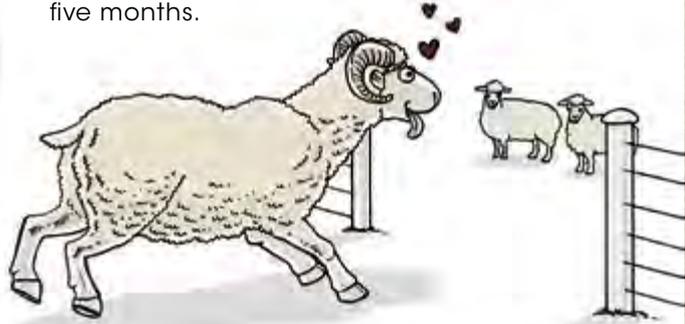


RAM REALITY

Rams are joined with ewes for about 5 – 8 weeks of the year. The rest of the time they are kept in separate camps.

ewe's uterus and develops until a fully-formed lamb is born.

Like all **mammals** newborn lambs drink milk from their mothers. Lambs start nibbling at pasture within the first few weeks after birth. They are **weaned** at between three and five months.



Ewes with lambs



Merino ewes are pregnant for five months

WHEN DO SHEEP START TO BREED?

Reproduction age depends on breed. A Merino ewe can become pregnant when she is about seven months old, although many producers prefer to wait until ewes are eighteen months old before joining them with the rams.

Rams are not usually put with ewes until they are about fifteen months or older. Usually a young ram is put with older ewes and an old ram is put with younger ewes.

Ewes must be healthy and have adequate nutrition during pregnancy to produce healthy lambs.

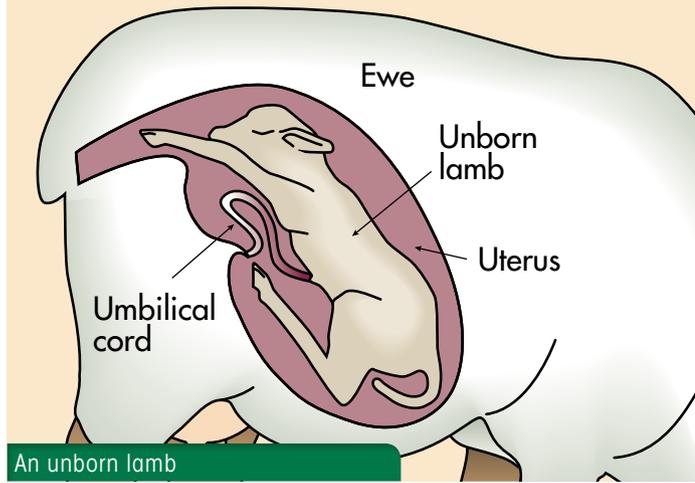
Rams and ewe



HOW LONG IS A EWE PREGNANCY?

The gestation period (time from mating until a lamb is born) in ewes is five months, or about 150 days.

Ewes usually have one lamb each year and can continue having lambs until they are about five or six years old.



Ewes can identify their own lambs



HOW TO TELL THE AGE OF SHEEP

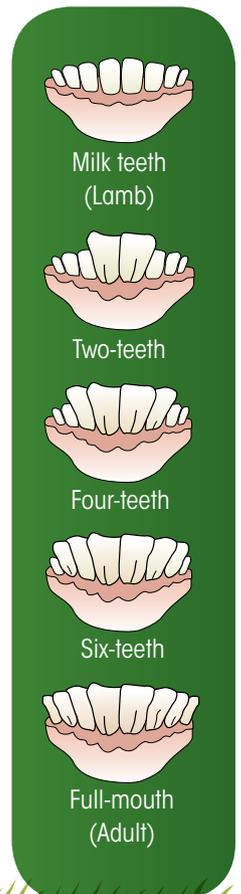
Teeth help to determine the age of a sheep. Sheep only have front teeth in their lower jaw.

A lamb has eight small incisor (cutting) teeth called "milk teeth". These are replaced by bigger and permanent teeth as a lamb gets older.

First the two in the middle emerge and later the teeth on each side. This process continues until the sheep is about three years old. By now it has eight large incisors.

Before they are full-mouth (adult), sheep are often referred to by the number of permanent teeth they have. For example, a two-tooth, a four-tooth or a six-tooth.

Adult sheep also have 24 molar teeth. The molars help with chewing. These are at the back of the jaw with six each side on both the top and bottom.





WHAT HAPPENS WHEN A LAMB IS BORN?

Ewes know when they are going to lamb and usually find a sheltered place in the camp away from other pregnant ewes to give birth.

Lambs can stand up and walk soon after birth. As soon as a lamb can stand it will find its mother's teats and have its first drink.

The first milk a ewe produces for her lamb is called colostrum. It is important that the lamb receives this because it contains **antibodies** that help protect the lamb from disease. The ewe produces it for about the first three days after the birth.

In the first few minutes after giving birth a ewe bonds with her lamb (or lambs if she has more than one). This ensures that the lamb stays close to the ewe for food and protection. A ewe will rarely accept another ewe's lamb.

Each ewe learns the individual smell and sound of her own lamb. In a large flock, the lambs can wander away from their mothers and play but each ewe will find her own lamb by recognising its specific smell and sound. Lambs stay with their mother until they stop drinking from her and get all their nutrition from eating grass and pasture. This is usually at between three and five months old.



Lambs stand and walk within minutes of their birth

DO SHEEP ALSO GET SICK?

Sheep cannot produce quantities of good quality wool and meat if they are not healthy and well fed – their health is therefore very important. Sheep, like other animals, birds and humans are prone to a variety of serious diseases and disease conditions.

These are caused by:

- **pathogens** such as **viruses, bacteria**, protozoa and fungi
- poisonous plants
- internal and external parasites like worms, lice and ticks.

Farmers follow strict **vaccination**, dosing and dipping programs throughout the year to prevent disease and unhealthy conditions. If they maintain the good health of their sheep they are ensured of optimum production and reproduction.

Farmers also make sure that sheep are not exposed to certain plants at certain times of the year.

These plants include those that are poisonous to sheep, like the vomiting sickness plant (*Geigeria filifolia*). It causes vomiting sickness, simply called "vermeersiekte". The first signs of illness appear a few days after grazing on *Geigeria*. Affected sheep lag behind the flock, tire easily, walk with difficulty and frequently lie down. Eventually

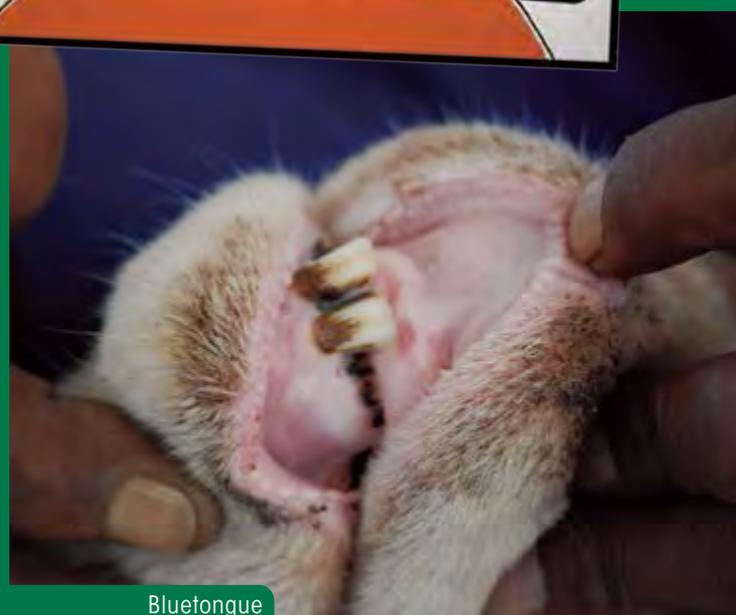
they become too weak to support themselves. Paralysis can set in.

Another plant which wool producers regard as a pest is burweed. (*Xanthium spinosum*). Burweed seeds cling to the fleece. The seeds are so hard it can cause damage to processing machines and therefore have to be removed by hand. Buyers are not interested in fleece contaminated with burweed seeds.

Farmers work very closely with other professionals and organisations regarding the management and well-being of their sheep. These include conservationists, veterinarians and nutritionists.



Bruzellosis



Bluetongue



"Jaagsiekte"



Internal Parasites



INFECTIOUS DISEASES

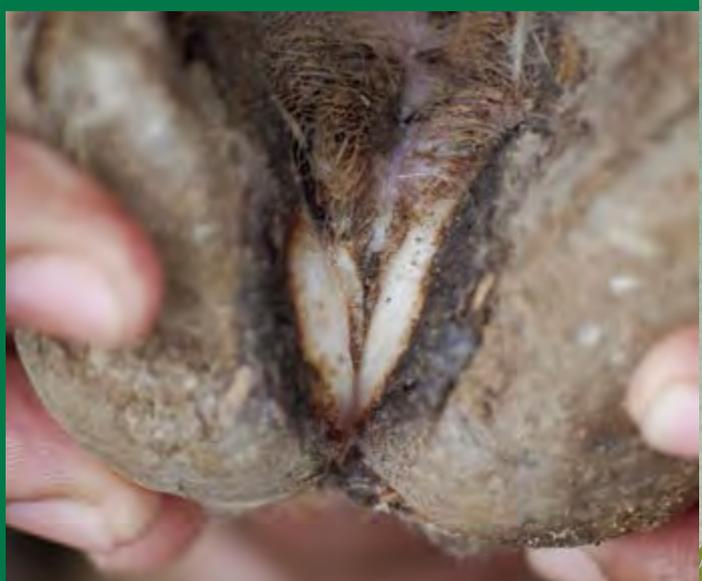
Infectious diseases are caused by viruses and bacteria that spread from one animal to another. Infectious diseases like foot rot and brucellosis may cause losses to the individual farmer. A disease such as Rift Valley Fever may even lead to an embargo on the export of wool. Farmers fight infectious diseases with strict vaccination programmes against the threats in their particular region.

NON-INFECTIOUS DISEASES

Non-infectious diseases can be caused by poor nutrition, **genetic disorders**, toxins, **metabolic disorders** or poor management. These types of diseases cannot spread between animals.



Foot rot





INTERNAL PARASITES

The most common health problem in sheep, especially young lambs, is internal **parasites** (worms and flukes). They breed in the sheep's digestive system. If left untreated they can lead to illness and death.

EXTERNAL PARASITES

The main external parasites that can affect sheep are lice and blowflies.

Lice are tiny sucking insects that live in the wool and feed off the sheep's skin.

Blowfly is a common sheep parasite, especially during the warmer months.



FASCINATING FACT

In 1908 the late Sir Arnold Theiler, formerly a Swiss vet, was instrumental in establishing the world-famous Onderstepoort Veterinary Institute near Pretoria. Onderstepoort trains vets, researches animal diseases and produces vaccines for the livestock industry. It serves the entire continent of Africa.

The word "vet" is a shorter form of "veterinary surgeon". (In English grammar this shortening of a word is called an "abbreviation".)

Female blowflies lay up to two hundred eggs at a time in the wool, usually around the sheep's bottom. Hatching larvae (maggots) feed on the sheep's skin and cause open wounds. This may result in the death of an infected sheep.

OTHER ANIMALS THAT PRODUCE FIBRE

Sheep are not the only animals farmed for their fibre.

Alpacas (a domesticated South American species related to the camel), goats, rabbits and silkworms also produce fibre.

Alpacas produce a fibre similar to wool. It is soft, strong and warm. It is used for making knitted and woven items including blankets, gloves, scarves and ponchos.

Mohair comes from Angora goats. It is hard-wearing, strong and versatile. Mohair has many uses including clothing and furnishing fabrics.

Cashmere is also produced by goats. It is softer than mohair and more luxurious. It is used mostly for knitwear and clothing.

Angora fibre comes from angora rabbits, and not angora goats as you might expect. It is soft, but not elastic. It is used for making clothing and for felting.

Silk comes from cocoons of silkworms. Silkworms are not worms but actually the caterpillars of the silk moth (*Bombyx mori*). Silkworms are no longer found in the wild, but are domesticated and farmed for their fibre.

Yaks, camels, beavers and possums also produce fibre which people can use. Yak



Possum fibre can be combined with wool

hair makes durable mats and sacks. Beaver fibre can be felted for hat making and possum fibre can be combined with wool to make warm clothing such as socks.



FIBRE FACT

Certain plants also produce fibre, such as cotton and linen. They are called natural fibres. Other fibres are manufactured by people in laboratories. These are called synthetics, or artificial fibres. Fibre from plants and animals is biodegradable. Synthetic fibre is not biodegradable.



Alpaca



Angora goats (mohair)



Silkworms (silk)



Goats (cashmere)



Angora rabbits (angora)



Yak (down)



Merino rams

A sheepy story

- The country of Spain was known for its fine Merino wool in the Middle Ages. Before the 18th century the export of Merinos from Spain was a crime punishable by death. The Royal Spanish House and other nobility jealously guarded their flocks.
- During the 1780's King Charles IV of Spain generously gave a few Merinos from his flock as a gift to King William of the Netherlands (also known as Prince Orange-Nassau).
- Sadly, the moist Dutch climate did not suit the sheep. But returning them to the Spanish king – thank you, but no thank you – wasn't an option. Someone came up with the idea of sending them to the Cape, as an experiment. In 1789 two rams and four ewes were put on board a ship to the Cape, then ruled by the Netherlands.
- The sheep were placed on the government farm, Groene Kloof (near the present day



Colonel Robert Gordon

Darling in the Western Cape). Here they thrived . . . until angry instructions came to return them to the Netherlands. They weren't supposed to have left the Netherlands in the first place!

- Colonel Robert Gordon, in whose care the sheep had been placed at the Cape, returned the same number of sheep that were originally sent, but kept their offspring.

The South African wool industry began with these offspring of the Merinos which shipped from Spain in southern Europe via the Netherlands in northern Europe to the southern tip of Africa.

THE SOUTH AFRICAN HISTORY OF WOOL FARMING

In 1795, Britain attacked the Cape and took over the Cape Garrison. Colonel Robert Gordon's leadership was severely criticized and he was accused of being a traitor. In despair, he committed suicide. His embittered widow, Susanna, decided to leave the country and take everything that belonged to him. She sold 26 Merinos to two British ships passing the Cape with supplies for Australia. The few left over she took with her to England on board the Britannia.

The Merinos she sold were the first ever in Australia and were the foundation of Australia's thriving wool industry.

Fortunately for South Africa, Colonel Gordon sold a few of the Merinos to the Van Reenen brothers, Sebastiaan Valentyn en Jan Gysbert, before his death. The Van Reenen brothers mated the Merino rams to three hundred hand-picked indigenous ewes. Their cross-bred offspring, plus a few Merinos that had been kept apart as a separate flock, were the first sheep producing wool on a large scale in South Africa.



Lord Charles Somerset

Lord Charles Somerset, who was governor of the Cape from 1814 to 1826, was very interested in sheep breeding. When the ban on the **export** of Merinos were lifted he imported pure-bred Merinos from England.

By 1830 wool farming was fairly well-established in the Western and South Western Cape. The next expansion was eastwards.

The Voortrekkers, the 1820 Settlers and the Khoi played important roles in the early development of the wool industry. The Settlers imported and further developed Merinos, the Voortrekkers from the Eastern Cape trekked northwards with their flocks and within a few decades the Merino had spread to all parts of the country. The indigenous Khoi sheep (the Van Reenen brothers mated their rams to the Khoi ewes) also made an early contribution to the wool industry.

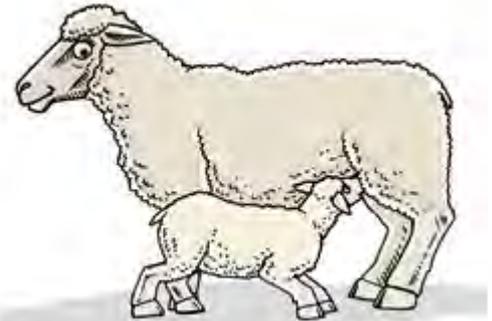




Michiel van Breda

MODERN WOOL PRODUCERS

Michiel van Breda, son-in-law of one of the Van Reenen brothers mentioned on p 25 started wool farming on Soetendalsvlei near Bredasdorp in 1817. This farmland is still farmed by the Van Breda family. The present farmer on Zoetendalsvallei is Michael van Breda who farms with Dohne Merinos.



FAMILY FARMS

In South Africa wool is produced mainly on family farms where the farmer owns the land. In many cases these farms are passed on from parents to their children. In this way some properties have passed through many generations of the same family.

Wool producers on family farms don't receive a regular salary or **wage** like someone who works for an employer (like your teacher, for instance). Their income comes only from the sale of wool or lambs. They have to plan very carefully to ensure that their irregular income lasts throughout the year.

NATIONAL WOOL GROWERS ASSOCIATION

The National Wool Growers' Association (NWGA) was established in 1929 to represent the wool farmers in the country and improve all aspects of the industry. Through the NWGA, which has branches all over the country, wool farmers can establish and maintain links with:

- institutions who buy and process their wool
- government programmes and policies that impact on their industry
- universities and research institutes
- other wool farmers and organizations in the rest of the world.

The NWGA represents the wool farming community. It has a voluntary membership of nearly 10 000 farmers, including emerging farmers on communal land.





COMMUNAL FARMERS

Wool farmers in communal areas do not own the area on which they farm, but share the same piece of land. The majority of the 17 000 wool sheep farmers in the former Transkei and Ciskei are small-scale farmers. Their herds average between twenty and two hundred sheep. Government provides shearing sheds for the different communities and their wool is marketed on the international market through the same channels that family farms use.



Communal farmers receive training



BAA ... BYLONIA

We do not know the exact date when sheep farming started. We do, however, know it goes back many thousands of years, long before recorded history. Woollen fabrics were woven in the city-state of Babylonia 4 000 years before Christ. The name "Babylonia" actually means "Land of Wool". Babylonia was situated in what is now Iraq.

- www.localharvest.org

STUD BREEDERS

A stud breeder has a dual role. He specialises in supplying rams to wool farmers (who usually farm with only ewes and wethers for wool production) to mate with the ewe flock. The breeder is also responsible for the genetic improvement of the breed.

Ram selection is the major path for **genetic** improvement. One ram normally has

more than a hundred offspring in a lifetime, compared to the five to seven lambs of the average ewe.

Stud breeders raise many rams. Their farm management is different from that of the flock farmer.

BREED ASSOCIATIONS

People with the same interests often work together to form an association. In the same way the stud breeders of the different wool breeds established breed societies to serve the interests of their members. The main tasks of a breed association is to:

- agree about breed standards
- help members to apply the best breeding practices
- publish a breed journal
- promote the breed.

HOW IS WOOL PRODUCED?

Wool producing involves many different jobs. Producers work throughout the year to keep their sheep healthy, and make sure they have enough food, water and shelter. Sheep need to be cared for to keep them free from pests and diseases so that they can produce lots of quality wool.

Like most types of agriculture, the seasons affect the production. Different jobs have to be done at different times of the year.

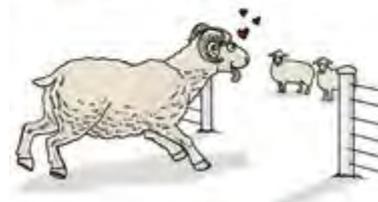
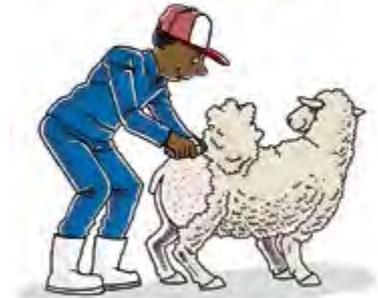
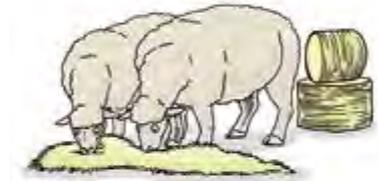
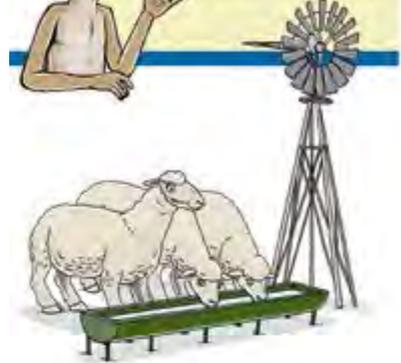
Wool producers plan and manage their sheep breeding programmes, and jobs such as shearing, to best suit the climate and rainfall where their property is located.

Most wool producers operate a mixed farming business. This means they usually produce more than just wool. Many wool producers also produce crops such as wheat, oats and/or canola and can run other **livestock** such as cattle.

Jobs carried out to produce wool must be fitted in with the other jobs needed to be carried out for other farm enterprises, such as growing crops. Producing many different products means wool producers are busy year-round.

In the course of a year the wool farmer has to:

- Check water supplies and troughs
- Monitor pasture quality and amount
- Feed supplementary nutrients and/or food if pasture is lacking
- Move sheep between paddocks
- Put rams with ewes (for 5 to 8 weeks)
- Shear
- Check that pregnant ewes have plenty to eat
- Drench, de-lice and vaccinate sheep
- Check ewes during lambing
- Provide extra feed and shelter for ewes and lambs or freshly-shorn sheep if the weather is cold
- Control predators
- Mark and vaccinate lambs
- Crutch adult sheep
- Check for fly strike during warm weather
- Wean lamb from ewes
- Draft off sheep to sell
- Purchase new rams
- Restock grain and feed supplies
- Sell wool



JUGGLING JOBS

Sheep need year-round care. It can be difficult for wool farmers to find time for a holiday away from their property. Producers try to plan breaks between major activities such as shearing and lambing.



In high-rainfall areas extra pasture can produce hay or silage for feed



Low-rainfall areas produce less pasture

GRAZING MANAGEMENT.....

Wool producers manage their properties carefully to make sure the sheep, pastures and soil remain healthy.

How many sheep graze a paddock and how long they stay there depends on how much feed (pasture) is available.

STOCKING RATES.....

The number of sheep grazing an area is called the stocking rate. In high-rainfall areas stocking rates are higher than in low-rainfall areas. This means more sheep can be kept on the same area of land.

For example, one hectare of land in a high-rainfall area can produce more pasture than one hectare of land in a low-rainfall area. Where there is more rain and therefore more

pasture, there can therefore be more sheep per hectare. In areas with low rainfall the camps and properties are usually larger to cater for the lower amount of pasture per hectare.

Wool producers adjust the number of sheep they have depending on the amount of feed available. They sell sheep when there is little feed, for instance in times of drought.



When feed is plentiful, wool producers buy sheep from other producers or keep more lambs to increase their flock size.

In plentiful seasons producers in high-rainfall areas can make hay or silage from extra pasture. They can then feed this to their sheep during summer, dry seasons or droughts.

ROTATIONAL GRAZING

Wool producers use rotational grazing in their paddocks to manage pastures. This means pasture in one paddock is grazed for a while and then sheep are moved to another paddock to allow the pasture in the first paddock to regrow.

Producers in high-rainfall areas tend to have smaller paddocks as pasture grows more quickly and sheep need to be moved between paddocks more often than in low-rainfall areas.

Paddocks in areas with little rain can be much larger and sheep may stay in one paddock for a long time.

All paddocks need water for sheep to drink in either **troughs** or dams. In low-rainfall areas producers often use watering points to muster

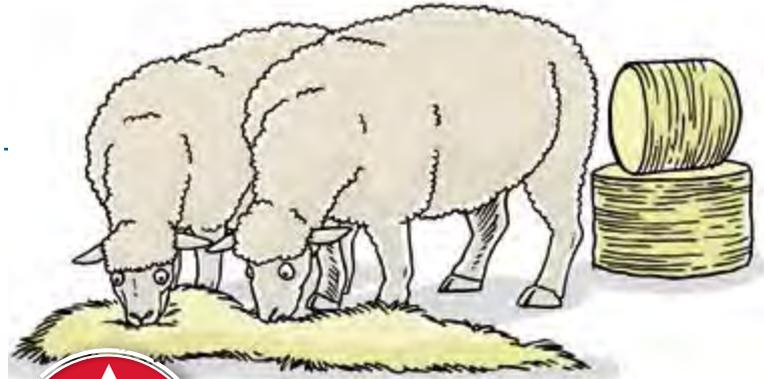
MOVING SHEEP

Wool producers muster their sheep to move them between paddocks or to bring them into the kraals for **drenching**, **marking**, **crutching** or shearing.

Mustering is usually done on foot or horseback. Sometimes sheep dogs are used. Depending on the size of the grazing camps and whether the land is mountainous or relatively flat, mustering can take from one or two hours to half a day. (In Australia properties are so large that aeroplanes and helicopters may help muster.)

Producers in high-rainfall areas choose, as well as plant, introduced pasture species that grow well in their area and contain lots of nutrients needed by sheep.

Many producers in low-rainfall areas have to manage their native pastures or plant drought-tolerant species to feed their sheep.



SICK SHEEP

Sheep can become ill and could even die if they eat poisonous plants. Wool producers constantly monitor their paddocks for poisonous plants.

(gather) sheep. Large paddocks are hard to muster and because sheep gather around watering points regularly, producers can use this to their advantage.



SHEEP BREEDING

Breeding is an important way wool producers can increase the quality and amount of wool their sheep produce.

Wool producers select their breeding stock from their best animals.

Choosing rams is especially important because a ram sires (fathers) as many as fifty or more lambs in a single season. Compare this to a ewe who produces only one or two lambs in a season. A ewe is usually kept for breeding for not more than five to six years. Producers select breeding ewes that produce lots of high-quality wool, and healthy, fast-growing lambs.



Wool producers showing their stock

SHEEP SELECTION

Wool producers can use specialist advisers to help with their breeding programmes. These advisers inspect the producer's sheep and the quality of the wool clip after shearing.

With the help of their advisers wool producers choose their best ewes to join (mate) with their rams to produce offspring that produce better-quality wool. Sheep with poor-quality wool or that don't produce any lambs are often culled (removed) from the flock and sold for meat.

Wool producers can buy rams from specialist properties called studs. Stud rams are bred to produce high-quality wool and can sell for high prices.

Different studs focus on different physical features in the rams they breed and offer for sale. Producers buy from studs that breed rams to suit their own flock and environment. Wool producers want rams that can sire many healthy lambs that will grow high-quality wool.





Producers regularly check ewes during lambing



Earmarking helps producers identify their sheep

LAMBING

Wool producers usually plan for lambs to be born during autumn through to early spring when there is plenty of pasture.

This way there is enough feed for the **lactating** ewes and the young lambs when they start eating grass.

Lambing during autumn means lambs should be strong before the harsh winter weather arrives. Where lambs are born during winter, producers make sure there is plenty of shelter in the paddocks to protect the lambs and ewes from the weather.

Lambing ewes are usually given paddocks that contain the most feed to support their high nutritional needs.

During lambing, producers check their flocks regularly to ensure ewes are not having any problems. Sometimes ewes can have difficulty and producers may need to give them assistance.



DID YOU KNOW?

Some wool producers use electronic ear tags. These are more expensive but can store a lot of information about the sheep. All the information on the tag can be scanned to a computer.

LAMB MARKING

Lamb marking is carried out when lambs are about two to eight weeks old. Lamb marking involves earmarking, vaccinating and docking (removing the tails from the lambs). Male lambs are castrated, unless they are to be kept for breeding.

Some producers give their sheep an identification tag in their ear. These tags mean sheep and products can be traced back to the property they came from. This can help manage and control diseases, if they break out.

Some producers use different coloured tags to show the year a sheep was born. In this way

it is easier to tell its age. Producers can also use an earmarking tool to cut a notch or mark in each sheep's ear.

Each wool property has their own registered tattoo mark. It makes identification easier.

Clearly marked sheep can be returned to their owners if they get through fences, become lost or wander into a next door farm and become mixed with the neighbouring sheep.

Earmarking is as simple as having your ears pierced.



SELLING LAMBS

Wool producers don't usually keep all the lambs they produce. They choose which lambs to keep for the breeding flock and wool production and the rest are generally sold.

This maintains the desired total number of sheep on the property each year.

MANAGING SHEEP HEALTH

Wool producers carry out a range of operations to keep their sheep healthy. This is much more effective than trying to "fix" sheep when they are already sick – as the proverb says, prevention is better than cure.

Making sure sheep have plenty of quality feed and clean water is an important part of livestock management.

Sheep need shade from trees and shrubs during the summer to help them keep cool and for protection during wet and stormy weather.

Producers also need to manage diseases and pests in their flocks. They do this by vaccinating, drenching, controlling lice and flies, stock and paddock rotation, and selecting breeding stock that are strong and healthy.

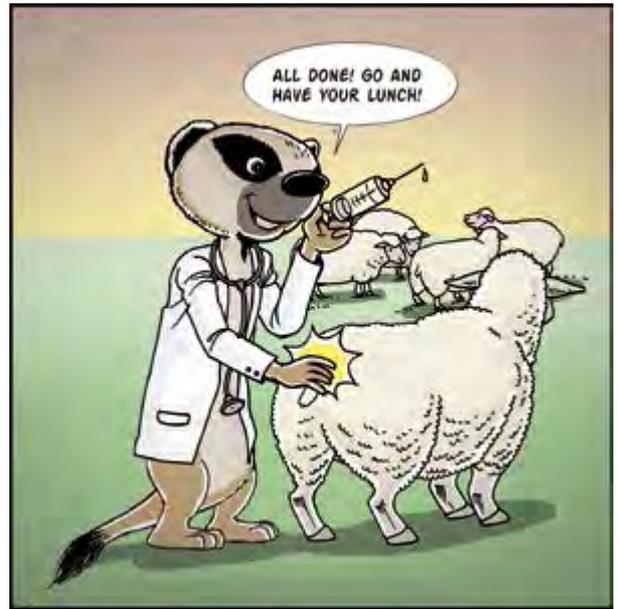
Sometimes the wool producer needs a vet to help treat sick and distressed sheep.

Wool producers also put a lot of effort into ensuring their sheep are not injured or killed by predators. The main predators that kill sheep in South Africa are jackall and lynx.

VACCINATION

Sheep are vaccinated against some common diseases while they are still lambs.

In South Africa a very wide range of vaccines are available against sheep diseases such as anthrax, lamb dysentery, pulpy kidney, tetanus, blackleg, pneumonia, contagious abortion (brucellosis) and abscesses. The vaccines come in various forms, and some are even combined with vitamins.



DRENCHING

Intestinal worms, or parasites, commonly affect sheep. Producers can drench their sheep with worming chemicals, like a liquid worm tablet, to control worms. Spelling paddocks

(paddocks where sheep are placed for a short time) can help prevent intestinal worm numbers from increasing. Don't worry - infected meat may not be sold.

FLY STRIKE

Fly strike is a common condition that affects sheep worldwide, including South Africa. Blowflies lay their eggs in damp or dirty wool, often around the sheep's bottom. Maggots hatch from these eggs and burrow into the sheep's flesh. The result is pain and sickness. If left untreated, the animal can die.

Regular crutching as well as **jett**ing with chemicals that deter blowflies from laying eggs in dirty wool are good precautionary measures.

Over the years the South African Merino has been bred for less skin folds, in other words for a "smoother" body. The result is less wool growth around the buttocks. If this area is less moist and woolly, the occurrence of blowfly is reduced. When there is evidence of fly strike in a flock, **pesticide** is immediately applied to the **breech** (buttock) area to kill the blowfly. This is standard practice.

The largest proportion of the South African wool clip is from harsh, low-rainfall areas like the Karoo. Luckily blowfly is not as prevalent here as in higher rainfall areas such as the coastal belt and the Highveld (around Dullstroom and Belfast).



Lice and fly attack

BLINKING BUMPKIN



A female blowfly can lay as many as 200 eggs at one time.

SHEARING

Shearing is the process of harvesting wool from the live sheep. Shearing does not cause injury or death, and a sheep can be sheared often.

One can be trained by the NWGA to shear. Once you are trained you can be employed by a company or individual shearing contractors. Shearing then becomes your career. Shearing is seasonal and during the season shearers travel across the country between farms, shearing sheep for a living. Each team is accompanied by a wool classer and a wool handler.

About two-thirds of shearing teams use

hand shears. A hand shearer will typically shear about fifty sheep per day, but there are shearers who manage many more.

Machine shearers use mechanical clippers similar to those used by hairdressers, but larger and stronger. Each hand piece is driven by an electric motor at the "stand" where each shearer works. A good machine shearer can shear about twice as many sheep as a hand shearer.

Shearing teams usually spend a week or more on a farm, depending on the number of sheep. Wool producers have to plan well ahead to coordinate teams.



SUPER SHEARERS

Sheep shearing competitions are very popular in South Africa, Australia and New Zealand. The world record for machine shearing Merino ewes is 466 ewes in an 8 hour shift.



Machine shearers at work

The world's champion shearers often come from South Africa



SHEARING THE SHEEP

Shearers bring the sheep from their **catching pen** to their stand on the floor. They are very careful about how they hold the sheep because they want to keep it calm. Shearers also take special care to avoid skin wounds to the sheep.

After the wool has been shorn and collected, the fleece is handled as one piece. It is picked up by a handler (also called a wool thrower) and thrown across a sorting table.

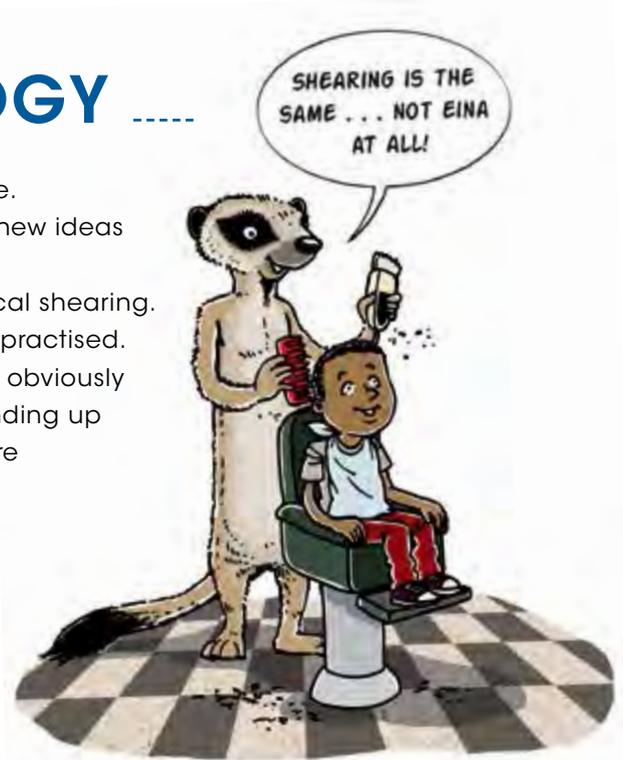
SHEARING TECHNOLOGY

The process of shearing has not changed much over time. Producers, shearers and researchers continue to explore new ideas and technologies.

New ideas include upright shearing as well as biological shearing. It is, however, only in the experimental phase and not yet practised.

Upright shearing will simplify the life of the shearer. It is obviously easier and healthier to work for a whole working day standing up instead of bending down. It is also envisaged that in future a machine could be used to carefully position and hold the sheep.

Another advanced method is biological shearing. This involves putting a net around the sheep and then injecting it with a protein. The injected chemical is supposed to break the wool fibre and the sheep should then shed its fleece in one piece inside the net.



PREPARING THE SHED

Before the shearing team arrives the farmer will carefully clean the shearing shed to prevent contamination of his wool clip. Other bits of fibre can come from dogs, coloured sheep, pieces of string or plastic. It is often seen only once the cloth has been made from the wool, causing serious losses to the manufacturer. It also harms the reputation of the country of origin.

Sheep must be dry to be shorn. If rain is likely the sheep will be kept in a shed the night before shearing.

Inside a well-planned shed each shearer has his own small catching pen. The various shed hands move the sheep from larger pens to these smaller ones. In this way the shearer does not have to chase after sheep in a large pen, and the farmer can monitor the quality of work done by each shearer.



Hand shearers at work

PREPARING THE FLEECE

After the fleece has been thrown on the sorting table the wool classer skirts it to remove the lower quality wool around the edges. This can include wool around the head and face, second cuttings and soiled pieces around the legs. Then the classer removes the wool at the neck. Neck wool is more variable because of the pleats at the front of the sheep. Back wool contains more pieces of plant material and dust than the wool on the sides of the sheep's body.

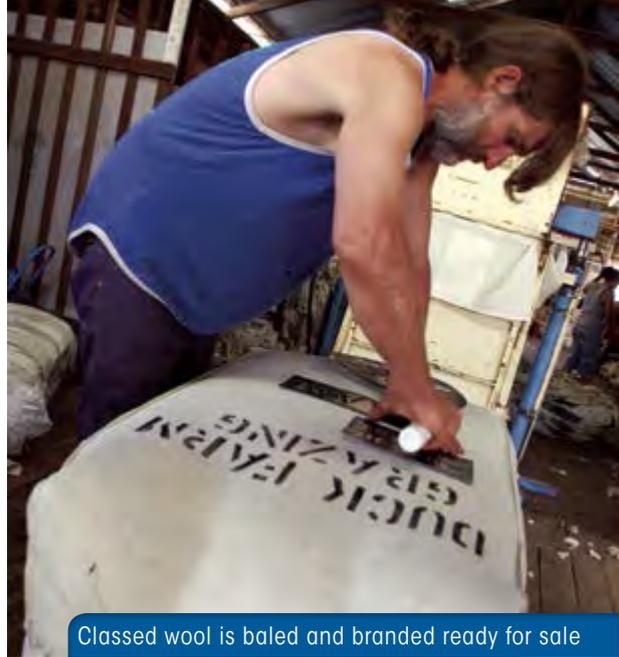
The main body of the fleece is then rolled and assigned to a specific standard based upon the fineness of the fibre and staple length.

Wool is sorted into five categories:

- fleeces
- **necks**
- backs
- bellies
- **pieces**

The classed wool is put into nylon **wool packs** and pressed into bales that are marked with the specific code for the type of wool and the wool producer's details.

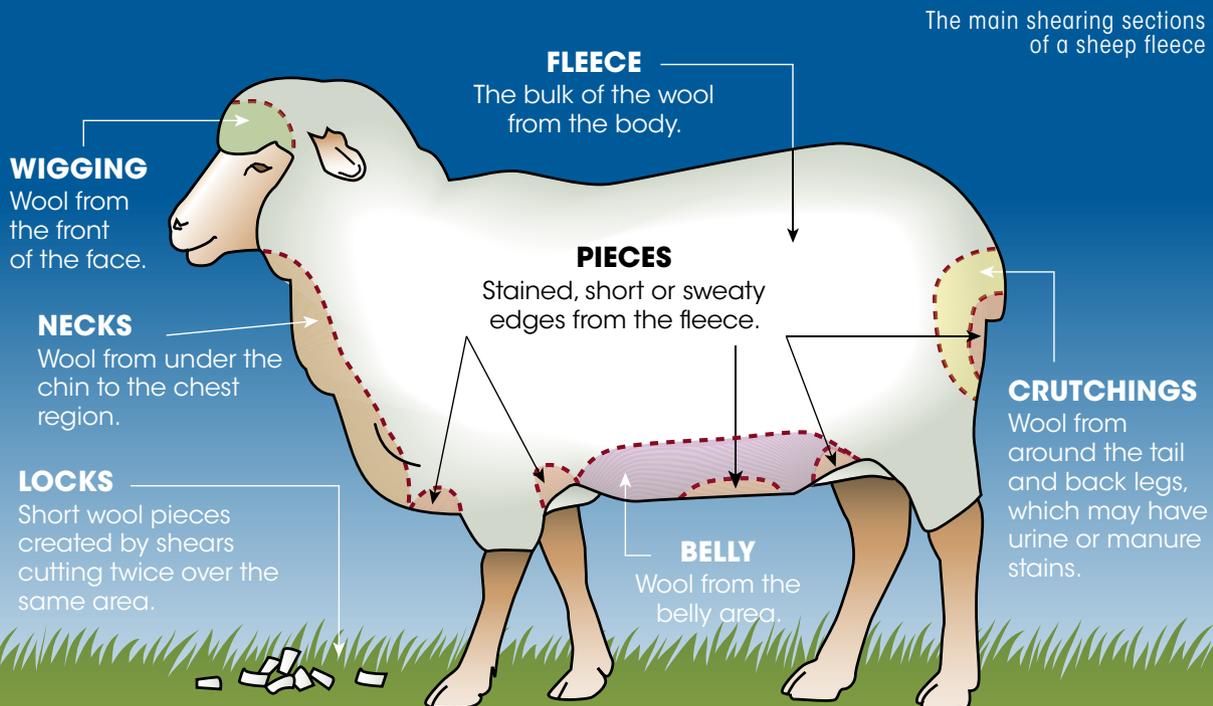
All South African wool is classed according to the NWGA's classing standards. The NWGA also determines the code system on all bales.



Classed wool is baled and branded ready for sale



Skirting the fleece





CRUTCHING

Crutching is a specific type of shearing and is usually not done at the same time of the year as normal shearing.

During crutching only the wool around the sheep's bottom is removed. Removing this wool helps prevent fly strike because it is dirty wool that attracts egg-laying flies.

BALING

South African producers use hydraulic presses to press the wool into nylon packs. These presses consist of a boxed container the same size as the nylon packs. The empty pack is fitted inside the press, filled with wool and pressed down by a plunger. It takes about sixty skirted fleeces to fill a wool bale. A bale weighs about 180 kg.



BAA BAA "BLINDNESS ..."



Sometimes a sheep cannot see because of wool growing over its eyes. This is called being wool blind, and is the origin of the idiom (saying) "to pull the wool over someone's eyes". When you pull the wool over someone's eyes you are being dishonest because you are deceiving them.



Wool fleece being classed



Large trucks transport wool

TRANSPORTING THE WOOL

Port Elizabeth is the heart of the wool industry in South Africa. Most, if not all, of the important role players in the industry are based here.

After shearing, classing and baling, producers deliver their wool clip to a wool brokering company of choice. Here it is temporarily stored in large warehouses.

Most of the South African clip is sold to overseas buyers. High-density presses are used to compress the wool bales into a third of their original size. Only then the wool is containerized for shipment.



Wool stores can hold thousands of bales

Most of the South African clip is sold and exported to overseas buyers



ANIMAL WELFARE

The South African woolgrower is always seriously concerned about the welfare of his animals and the environment. Resource-based conservation is a high priority and the “clean green” approach is a natural business ethic.

Internal (per mouth or injection) and external (applied to skin) stock medicines are used sparingly and only when there is no alternative.

The result is a healthy, well adapted national flock that thrives in our natural environment.



CODE OF BEST PRACTICE

The Best Practice Reference Manual for Wool Sheep Farming in South Africa (BPRM) encourages farming practices that:

- enhance animal welfare
- respect and care for the environment
- involve social responsibility.

Sheep have to be physically handled for health care reasons, de-horning, tail docking, **castration**, ear marking, shearing, moving sheep around, caring for orphan lambs or pregnant ewes. If this is not done correctly animals can experience pain and distress. It is important that all these procedures are performed with the necessary ability and knowledge.

The BPRM describes in detail how best to deal with the many tasks of the wool farmer. It also makes recommendations on all the facilities needed on the farm to ensure that animals are well cared for.





THE WOOL PRODUCER'S OTHER JOBS

Wool producers do a lot more than only look after sheep. To begin with, they have to ensure that fences, buildings and machinery are kept in good working order. Apart from this they have to regularly check and maintain water supplies in troughs and dams.

Wool farming, like any other business, also entails office work. They need to keep financial records (money spent and earned), livestock records and farm planning records.

Many wool producers run mixed farms. This means they grow crops as well as keep livestock such as cattle. On mixed farms there are tasks that need doing for the other areas of production, like harvesting crops or cattle work.

Farming is a complex business and farmers have to manage many daily activities so they can achieve their long-term goals.

Just like other hardworking people, it is important for wool producers to make time for holidays. Taking a break gives them the chance to rest, relax, spend leisure time with loved ones and return to the farm with new energy and enthusiasm.



SHEEPDOGS

Sheepdogs play an important role on certain wool producing farms where they are kept primarily as working dogs and not pets. Some farmers believe one sheepdog is worth four people when herding sheep.

A shepherd is someone who looks after sheep, either with or without a sheepdog to help him. It can be the farmer and/or a farm labourer.

Sheepdogs have a natural herding instinct to keep a sheep flock together. With the right training a puppy with a good instinct becomes a very valuable asset on a farm.

Sheepdogs are extremely clever, energetic and athletic. They can run fast and far, even in the heat of South Africa's wool producing areas. In one working day they can cover as much as twenty kilometers.

Many wool farmers do perfectly well without sheepdogs, but where they are used they are valued as loyal workers, partners, companions and friends. Border Collies and Australian Kelpies are the most common breeds on South African wool farms.

They love working with sheep. Their greatest treat is to be invited onto the back of a bakkie, driven to a flock of sheep and obey instructions quickly and correctly. They are happy to work any day of the week – for the fun of it, a bowl of food and 24/7 access to fresh water and shelter. Sheepdogs are not bred (or bought) for their looks, but for their ability to work with sheep. All dogs stem from wolves and were originally predators. In the selection process, the killing instinct of the sheepdog has been bred out and the herding instinct cultivated. Good breeding and training enhances their natural driving and herding instinct.

Sheepdogs work in kraals, camps and shearing sheds. They:

- gather sheep
- move sheep around from camp to camp
- drive sheep to, for instance, the kraal or shearing shed
- help move them through gates or onto trucks.



Jill, Dog of the Year 2013



Don, National Champ 2013

The first Border Collies were bred on the border (hence the name Border Collie) between England and Scotland in the 1800's. The first Kelpies were developed in Australia. Their ancestor was a Collie called Kelp.

SHUCKS SHEEPDOGS!



Competitions for sheep dogs and their handlers are held throughout South Africa from March to September. They are organised by the South African Sheepdog Association (SASDA). The main aim is to promote sheepdogs as a labour saving force. This is done through demonstrations, courses and competitions. Courses are designed to test the dogs' working ability.

Sheepdogs even help count sheep by holding the flock together and controlling the amount of sheep moving past the person counting.

Some sheepdogs will run across the backs of sheep when they are in a kraal and help push them up to the **race** for drenching and vaccinating. Others will move alongside the flock to do so.

Sheepdogs do not live with the flock because they are not bred to guard livestock.

Sheepdogs make eye contact with sheep when gathering them. They carefully watch to be aware of the way the sheep will move. A well-trained dog watches the sheep but also listens for voice or whistle commands

from its shepherd. It also takes cues from the shepherd's body language.

Training begins when a puppy is between six and twelve weeks old. The aim is obedience, loyalty and various skills to move and herd sheep. The shepherd uses different whistling sounds for the different commands. He/she uses body language (which the dog instinctively understands) to teach the dog the whistle and voice commands. For the whistling commands the shepherd uses his finger between his lips, or a special shepherd's whistle.

NAMING YOUR SHEEPDOG

A name must be short and easy to pronounce, shout and call. Preferably it consists of only one syllable. For example: Don, Flint, Jill, Trig, Tip, Tiggy, Quin, Shep, Spot.

Imagine you were the owner of a sheepdog. Think of a name which is short and sharp.



WOOLLY WORDS!

The word shepherd comes from an ancient English word "scēaphirde". Not difficult to spot the "sheep" and the "herd" in the word, is it?

SHEPHERD'S WHISTLES

These are designed and used only for working dogs.

In large camps it is often necessary to communicate with a dog, or a couple of dogs, at a distance. It can also be difficult to make your voice heard over and above the bleating of a flock of lambs and ewes, in strong wind or stormy weather. This is why whistles (the sound of which carry further than a voice) are important communication tools. Well-trained dogs know both whistle and voice commands.

Shepherd's whistles can be made from various metals or plastics. Most are machine made. Dogs respond to the different sounds of



Shepherd's whistle

a whistle. The same goes for whistling through the teeth or with your lips.



FARM SAFETY

Producers take care to prevent accidents on properties.

Sheep are generally not dangerous animals. Correct handling by farmers, their families and employees is particularly important in kraals and shearing sheds where people, dogs and sheep are together in a relatively small space.

Rams can be unpredictable and aggressive, especially when confined in a kraal. Sheep can also take fright and run – people around them must be aware of this.

Wool properties have bakkies, tractors, motorbikes, trucks and shearing shed equipment. Owners and employees must ensure that crawling babies, toddlers and young children are moved safely out of the way when vehicles move about.

Producers maintain farm machinery to keep it in safe and good working order. Labourers must



know how to operate (and store) it safely and responsibly. Farm motorbikes should not be driven without safety helmets and proper footwear.

Shearing sheds are well lit and all equipment well maintained to keep it safe and in good working order.

CHEMICALS

Farm chemicals are supposed to be stored in locked chemical storage areas. Some veterinary chemicals, such as vaccines, need to be kept cool and are usually kept in

a locked fridge. Producers are careful to use chemicals only as instructed. All needles used for vaccinating are properly disposed of after use.

SUN EXPOSURE

Wool farmers are often outside. They reduce the dangers of sun exposure and heat exhaustion by wearing hats, long-sleeved shirts and sunscreen. They also drink plenty of water to avoid dehydration.

During summer, wool producers often work outside in the early morning or late afternoon when it is cooler.

CHILDREN ON WOOL PROPERTIES

A wool farm has lots of space, and children can have loads of fun. They can keep large animals, like horses, and often have motorbikes. There is always plenty to do on the farm and they can partake in different activities under adult supervision.



Children carding wool

HELPING WITH JOBS

Children can take part in mustering or moving sheep from one camp to another. During lambing, they can check the ewes to see if any are having trouble.

Sometimes there are orphan lambs (“hanslammers”) that need bottle feeding many times a day when they are still young. Their milk is made from a formula, specifically for lambs.

During the shearing period the shed needs to be cleaned and the wool sorted. Here too, like feeding the lambs, children can lend a

hand and enjoy it. They can also help move sheep in the kraals and pens.

Other activities they might find interesting include lamb marking, drenching and caring for the sheep dogs.

GOING TO SCHOOL

Many wool properties are very far from towns or cities. This means children often have to attend a school with a hostel. Then they

are at home only over weekends (if the farm and the school are not too far apart) and during the holidays.

HOW DO PRODUCERS SELL THEIR WOOL? -----

These days the bulk of the **wool clip** is marketed through large wool brokering firms. The largest percentage of the clip is sold by way of an **auction system**. However, some farmers prefer to sell privately.

Auctions have been centralised in Port Elizabeth and take place once a week during the wool season, which runs from August to June.

Over the years South African wools have built up a good reputation as extremely well-classed and well prepared for the market.

FIBRE TESTING -----

Wool quality depends primarily on fibre fineness, clean yield, levels of vegetable matter and dust contamination. Before every auction a random sample of wool is taken from each bale and measured to determine the mean fibre diameter, vegetable matter content and clean yield. This information appears on the catalogue for each lot put up for sale.

WHO BUYS SOUTH AFRICAN WOOL? -----

About 80% of our clip is exported as greasy (unwashed) wool. The Companies buying wool on the auctions are registered members of the South African Wool and Mohair Buyers Association (SAWAMBA).

These companies are well established and reputable, and purchase and finance 100% of the wool bought on auction.



WOOLLY WORDS!



During colonial times the Cape was the most important wool-producing area in Southern Africa. The sheep industry spread rapidly throughout most of the country, but "Cape Wool" became the international generic trade term for all wool produced on the sub-continent.

Because of its softness, Cape Wool is ideal for modern fabric or knitwear to feel soft against the skin. The full palette of fashion shades required by the industry is possible because of the bright, white colour of Cape Wool.

They purchase the wool for their own processing needs or on behalf of other overseas wool companies.

Our most important export destinations are: China (by far our largest buyer), Czech Republic, India, Germany, United Kingdom, Egypt, France and Mauritius.



Wool samples are tested for quality

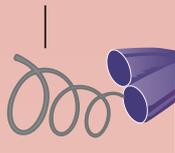


Samples of different fibre diameters

Taking a closer look inside a wool fibre

Helix of long chain amino acids

A single wool fibre contains 20 different types of amino acids, which are joined head-to-tail to form long helix-shaped chains of protein molecules, with about 400-500 amino acids per chain. Keratin is the most commonly occurring protein found in wool.

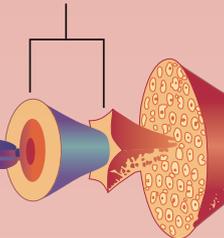


Protofibrils

Wool's long chains of protein molecules are wound around each other to form coiled ropes called 'protofibrils'.

Microfibril

Groups of protofibrils wrap around each other to form a rod-like microfibril.



Macrofibril

Microfibrils wind around each other in a helix pattern to form a macrofibril.

Epicuticle

Exocuticle

Endocuticle

Cuticle

The scale-covered cuticle is made up of at least three layers — including the outer layer, or epicuticle, followed by the exocuticle and endocuticle.



Cortex

The cortex, or inside of the fibre, contains long thin bundles of fibrils. The number of bundles depends on the micron, or fibre diameter of the wool. Finer wool has fewer bundles than coarser wool.

WOOL STRUCTURE AND QUALITY

Wool producers and manufacturers have many different terms to describe wool because it varies in colour, quality and length. These differences affect the value of wool.

Fibre samples from wool bales can be tested to give wool producers and buyers

accurate measurements, such as the fibre diameter and **staple** strength.

This information about the wool quality can help producers manage their flocks in future years. It is also helpful for wool buyers who may want a particular type of wool for processing.

MICRONS

Microns are the units used to measure the diameter (the straight line from one side to the other) of wool fibre. One micron is one micrometre - a millionth of a metre. The lower the micron count, the finer the wool. SA's average wool micron has decreased because over the years Merinos have been bred to produce finer and finer wool. Diameter determines the fineness of the yarn that can be spun from wool. Most wool used to make clothes is between 18 and 21 microns. Based on micron measurement wool has different grading: ultrafine, superfine, fine, medium and strong.

Wool micron grades

Micron	Grade
<15.6	Ultrafine
15.6 – 18.5	Superfine
18.6 – 19.5	Fine
19.6 – 22.5	Medium
>22.5	Strong

WOW WOOL

Human hair has an average diameter of about 65 microns. Compare this to the much finer average diameter of **superfine wool**, which is 15.6 – 18.5 microns.



STAPLE LENGTH

Staple length refers to the length of the wool fibres. It is measured in millimeters. It is determined by the length of time the wool has been growing and how productive the sheep is at producing wool.

Lambs' wool has a shorter staple length than wool from older sheep.

Longer staple length wool is preferred for textiles manufactured using the worsted processing system. The worsted processing system is explained on p 50.



Staple length is the length of wool fibres

Strong fibres are better for wool processing



STAPLE STRENGTH

Staple strength refers to the amount of force required to break the fibre. The strength affects the way in which the wool is processed, and what it can be used for.

COLOUR

Natural washed wool varies in colour from white to cream. White and cream can be dyed any colour.

Black wool will not take colour. It is therefore not used in large-scale wool processing.

In South Africa karakul sheep produce black, grey or brown wool. It is a very coarse fibre, and used mostly for rugs.

Sometimes one sees a sheep, which is not a karakul, with black or brown wool. This can be a rare variance of the white wool breeds. Some craftspeople use this to make naturally coloured yarns and textiles.

Examples of items that can contaminate wool

Coloured wool



Hair fibres from other non-wool producing sheep breeds or animals



Plant material such as prickles, sticks and leaves



Dirt and stains from manure and urine



Unwanted objects that accidentally get pressed such as clothing, nuts and bolts and even bale hooks



WOW WOOL



A 170 kilogram bale of white wool can be contaminated by as little as one-tenth of a gram of coloured wool.

CONTAMINATION

The value of wool can also be affected by contamination in the fleece. Wool producers work hard to reduce the amount of contamination by foreign objects such as thistles and burrs (prickly plant bits that cling to wool), or dirt stains from manure or urine.

Particular care is taken during shearing to ensure no unwanted object gets accidentally placed in the bales as the wool is pressed.

PROCESSING

Wool that has been removed from sheep after shearing is called greasy wool.

Processing cleans greasy wool and prepares it so it can be made into a wide range of products.

There are different ways to process wool. This depends on what the final product is going to be.

Both wool and hair are natural fibres, but the structure of wool makes it more useful than hair.

Wool fibres can be manipulated to lie more or less parallel to each other. These parallel fibres can then be drawn out to a required thickness. At the same time they are twisted around each other to create a strong yarn. These yarns can be woven or knitted into sheets of material which can be used for making many items: clothes, curtains, linen, carpets, furniture upholstery etc.

Wool fibres can also be entangled and compressed to create a cloth-like material called felt. Felt is used to make hats, various accessories (like brooches and necklaces) and sound dampening materials used, for instance, under the bonnets of cars or in pianos.



Worsted yarn – is given extra combing to remove shorter fibres and make it smooth.



Woollen yarn – includes shorter fibres and is much bulkier to touch.

A Blending

Blending mixes different wools together. Processors can blend different wool to make sure they have enough fibre with the right characteristics to suit the final products they are making. Wool can be blended both before or after scouring.

B Scouring and carbonising

Scouring and carbonising are the first stages of wool processing and nearly all wool processing starts with one or both of these steps.

Scouring washes the **greasy wool** to remove the dust, dirt and grease. (The grease, called lanolin, is used to make other products such as moisturising creams.)

Carbonising removes vegetable matter. The **woollen system** includes carbonising because the wool used in this system has a higher level of seeds and burrs to remove.



Scouring cleans dirt and grease from the fleece

C Carding

Carding uses rollers with lots of metal spikes to start untangling the scoured (cleaned) wool. The spiky rollers act like wire brushes, smoothing the wool out to a long, even web called a carded **sliver**. Carding can also help remove any seeds and burrs left in the wool.



Carding untangles the wool into a long sliver

D Drawing

Drawing stretches or pulls out the wool top so that it becomes longer and thinner. After drawing, the wool top is called a **roving** and is ready for spinning.



Drawing makes the top thinner for spinning

PROCESSING WOOL INTO YARN

There are two main systems of processing wool into yarns: the **worsted system** and the woollen system.

The worsted system uses longer wool fibres from the fleece. Worsted processing includes more stages and produces high-quality yarn. This type of yarn looks smooth and neat.

Worsted yarn is used to make lightweight fabrics and materials.

Fine-textured, smooth garments are made from worsted yarn. This includes business suits for men, formal jackets for women, dresses, sports clothing and underwear.

About 80% of South African wool is processed through the worsted system.

The woollen system uses shorter wool fibres, such as **locks** and crutchings. Woollen processing includes fewer stages and produces a bulkier yarn. This delivers a fabric with a more textured surface compared with a worsted yarn.

Woollen yarn is used to make heavier-weight fabrics and materials. Overcoats, socks and blankets are often made from woollen yarn.

About 20% of South African wool is processed through the woollen system.

E Gilling and combing

Gilling and combing are used in the worsted processing system to continue smoothing and untangling the wool.

Gilling involves pulling the wool sliver through a coarse (wide-tooth) comb with teeth that help the wool fibres line up in the same direction (parallel).



The final combed wool sliver is called a top

Combing uses a finer-toothed comb to keep smoothing out the wool. Combing also removes shorter wool fibres (noils).

A combed sliver is called a **top**. The top is smooth because it is made up of longer wool fibres that are now lined up neatly in the same direction.



Gilling aligns the fibres before combing

F Spinning

Spinning continues to reduce the thickness of the roving and also twists it to bind the fibres together in a continuous yarn.



Spinning twists the fibres into a continuous yarn

G Dyeing

Dyeing is the process of colouring the fibre. For both worsted and woollen processing the position of the dyeing step depends on the end use of the wool. Wool can be dyed as scoured wool, tops, yarn, and fabric or even after it has been made into a garment.



Dyeing colours the fibres



Weaving forms flat panels of fabric



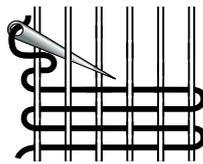
Circular knitting makes garments such as socks

MAKING YARN INTO FABRIC

After wool has been processed into yarn it can be made into fabric. Fabric can be made by weaving the yarn or knitting it. The final products will have different qualities, depending on whether they have been woven or knitted.

WEAVING

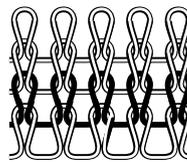
Weaving forms a flat panel of fabric by threading yarns over and under each other. Some yarns run up and down the fabric piece, and other yarns run across to make the weaving pattern.



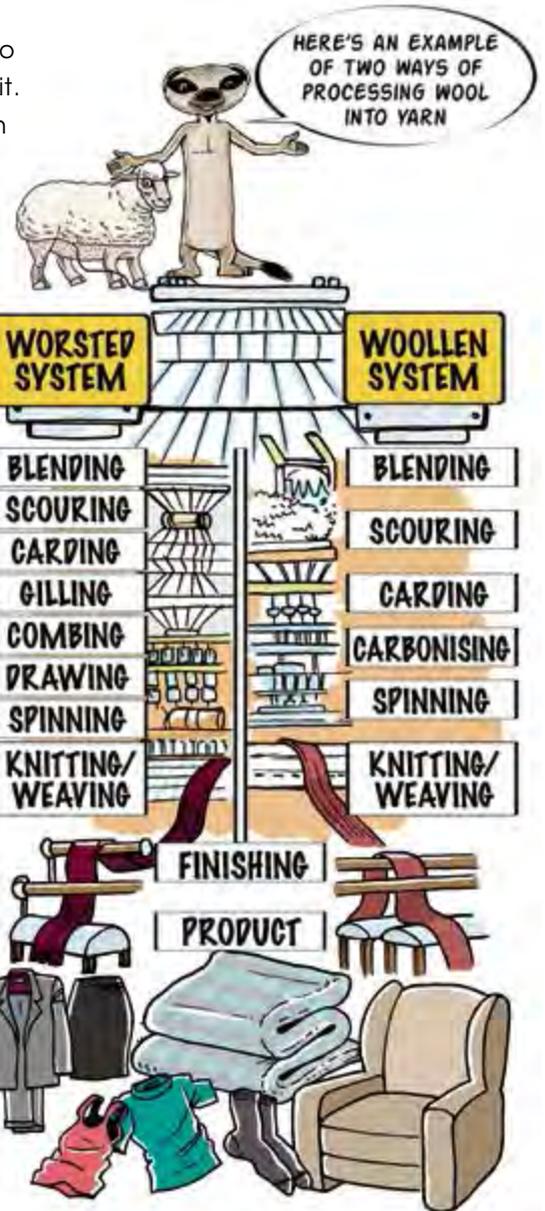
Yarns that run the length of the fabric are called "warp" yarns. Yarns that run across the fabric are called "weft" yarns.

KNITTING

Knitting forms a fabric using a series of loops to bind one or more yarns together.



Knitting can make flat panels, or circular tubes of fabric. The circular knitted tubes have no seams so they can be custom-made to produce items such as socks. Knitting can also make shaped flat pieces, which are then joined without cutting to make knitwear products.



FASCINATING FACT

Up until the late 18th century, people processed wool in their own homes. Each producer would clean, card, comb and spin their own wool. The industry was moved into factories during the Industrial Revolution and machines replaced the traditional hand processes.



HOW IS WOOL USED?

The unique properties of wool make it suitable for use in different ways.

Wool is used to make clothing including sportswear, business suits, fashion garments, knitwear and underwear. It can be used to make warm clothing as well as clothing which keeps one cool in the heat.

WOVEN AND KNITTED

Most South African wool is processed into yarn, which is woven or knitted for high-quality fabric and garments. Wool has natural elasticity. It can therefore stretch and then return to its original shape. Wool can be made into different types of yarn and fabric depending on its end use. Some wool products and clothing are lightweight, others are heavier.

NON-WOVENS

Some wool is made into products without first creating yarn. These are called non-woven products. Non-woven wool can be used as filling in duvets and pillows, in the lining of jackets or in disposable wipes, filters, home furnishings and insulation

Felt, for instance, is a non-woven product. The wool fibres are entangled and compressed.



Merino wool is used to produce high-quality clothing products





Winners of a Cape Wools scarf competition: Laume, Madri and Odet van Wyk

COMBING MILL

Cape of Good Hope Wool Combers (CGH) situated in Uitenhage near Port Elizabeth is the only sliver wool top combing mill in South Africa. It was established in 1948 and is part of the Segard Masurel Group.

This Mill scours, cards, and combs wool into wool tops as explained earlier.

A Visit to see these processes can be arranged by appointment and can be an interesting experience.

Visit their website www.segardmasurel.com to read more about the group or to contact them.

WEAVING MILL

Hinterveld is in Uitenhage near Port Elizabeth in the Eastern Cape. It is a weaving mill which makes fabric (textiles) from Merino wool and Mohair (which comes from the angora goat).

Hinterveld belongs to the Stucken group of companies. This group is 150 years old and run by the 6th generation - amazing in a relatively young economy like South Africa.

Their fabric is used to make blankets and scarves. Most of the products are exported to customers around the world. Inspiration for their blankets and throws comes from, among others, the corn blankets of the Sotho, the burnt orange blankets of the Xhosa and the colourful blankets of the Ndebele.

Laduma Ngxokolo, with his MaXhosa logo, is known throughout the world as a knitwear designer. Browse through his trendy clothes at www.africanknitwear.com. He has collaborated with



Various uses of wool

Hinterveld to design a range of mohair blankets that echoes the natural beauty of the Eastern Cape.

This is how Hinterveld goes about its woolly business:

- wool is bought at auctions
- wool is washed and combed at the processing plant, Gubb & Inggs
- wool is spun into yarns at the spinning mill, Mohair Spinners South Africa (MSSA)
- wool is dyed and woven into fabric

The three Hinterveld mills stand next to each other.

FAST ASLEEP UNDER FLEECE

In the winter of 1981 Andrew and Wendy van Lingen had a baby on their Karoo wool farm Sunnydell in the Sneeu Berg Mountains ("sneeuberg means snow mountain"). In winter it can become bitterly cold - despite the farm's sunny name! Wendy washed and combed a fleece of wool and stitched it between two pieces of cotton. Within hours the newborn was completely snug under a warm, lightweight and non-allergic duvet. And you know why, don't you? (And as you read on p 5 wool is warm in winter, and light and cool in summer.)

When friends saw how well the tiny duvet worked they placed orders. A home industry sprang up and soon Wendy involved the wives of the labourers. Next she bought spinning wheels, carders and a small loom, and trained the women. First the women made handspun jerseys. At that time all duvets in South Africa were either made from artificial fibre or duck down fillers. The project mushroomed. Sunnydell moved looms and all to Temple Farm when the duvet business took off.

Sneeuberg is now situated in Middelburg. The flocks roam freely on Temple Farm where the "clean green" approach is a natural business ethic. Internal and external stock remedies (medicines) are used sparingly and only when there is no alternative.

Sneeuberg (www.sneeuberg.co.za) makes wool duvets and pillows, as well as insulation.



Carpets
Blankets



Medical dressing



Furnishings



Duvets and pillows



RESEARCH AND DEVELOPMENT

Researchers are continually looking for new ways to improve wool products and to stimulate consumer demand for wool.

Thanks to research, wool fabric can now be treated fairly easily to make it machine washable and quick drying. Wool fabric has become more crease resistant. It requires little or no ironing. People who regularly fly across continents choose woollen items. After hours in a suitcase they can be taken out and worn, perfect for any meeting or outing.

Researchers are constantly developing new textiles that make the most of wool qualities, either as 100% wool fabrics or as blends with other fibres.

In South Africa research is done by various institutions, including universities and the Agricultural Research Council (ARC).

Research on textiles and processing technology is done by the Council for Scientific and Industrial Research (CSIR) in their textile and materials laboratory in Port Elizabeth.

These laboratories also explore problem solving and quality control for fibres, yarns and fabrics. One of the tools used is a body scanner and a robot mannequin to simulate sweating.



Retailers test Merino wool products to improve the quality of garments

Business and media personality Jo-Ann Strauss, admiring a stud ram



BLENDING WITH OTHER FIBRES

Wool can be combined with other fibers to maintain the benefits of wool and to give the final product different characteristics.

Some manufacturers blend wool with other natural fibres such as cashmere to make coats and knitwear.

Wool can also be blended with synthetic fibers such as lycra for greater stretch or durability.

A new development is making composite materials from resin combined with wool and other natural fibres. These are used in aeroplane and motor vehicle parts.



FASHION DESIGNERS

Fashion designers are an important link between the wool producer and the consumer. They use the materials created by the textile designers to create items from popular clothes to more timeless classics for the consumer.

WHO WORKS IN THE WOOL INDUSTRY?

The South African wool industry provides thousands of jobs throughout the **supply chain**: from farm labourers through to processors and retailers.

Wool producers often employ and work with other people such as stock handlers, agronomists (people who specialise in the management of soil), accountants, mechanics, livestock agents, wool buyers and vets.



Models exhibiting the work of fashion designers



Careers in the wool industry



Wool producer



Wool traders



Stock handler



Shearer



Wool textile designer



Wool technical adviser

WHY IS WOOL IMPORTANT?

Wool is important to consumers because it is a natural fibre with a wide range of useful characteristics.

The fineness of the Merino wool fibre makes it soft and provides insulation. Merino wool is finer than other types of wool and it feels gentle when worn against skin.

The tiny scales on each fibre help wool products to repel (drive away) water and resist stains. The elasticity of wool helps it hold its shape well and resist creases.

Wool also "breathes". This means it can absorb perspiration and release it into the air. This characteristic helps stop wool products from holding odours (bad smells).

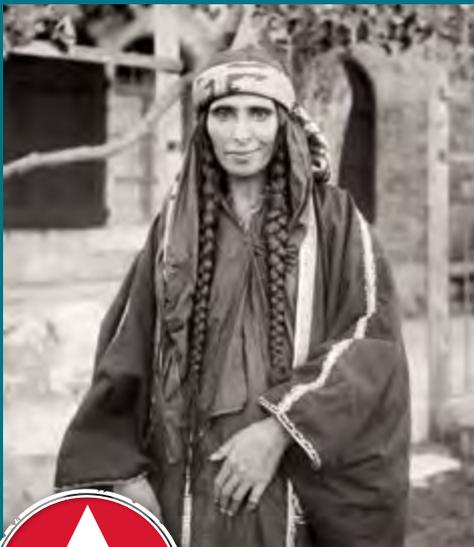
Wool can react to changes in body temperature to hold warmth when it is cold but, when it is hot, it can release heat and moisture.

Wool absorbs moisture from the air which makes it, to a certain extent, anti-static. It is therefore less likely to "cling" when it is worn.

Wool is ideal for use in summer because it offers natural UV protection (30+) and insulation.



Wool is a fire-resistant fibre, which is useful in clothing as well as a product like housing insulation.



Wool keeps you warm



Wool is water-resistant



Wool is flame retardant



FASCINATING FACT

The nomadic and semi-nomadic Bedouin tribes of the Sinai desert have been wrapping themselves in wool for centuries. Temperatures in the Sinai can range from below zero to over 40° at different times of the year. (Try and find the Sinai desert on a map. Tip: it's between Africa and Asia.)

EXAMPLES OF NATURAL AND SYNTHETIC FIBRES

Not all fibres are natural fibres like wool. Some fibres are made by people and are called synthetic.

In recent times synthetic fibres have been used for some of the things wool

was traditionally used for, such as clothes and blankets.

Synthetic fibres are made in laboratories. There are two types of synthetic fibres – artificial fibres and true synthetics.

NATURAL FIBRES

Natural fibre comes directly from animals or plants.

The main natural fibres from animals which people use include:

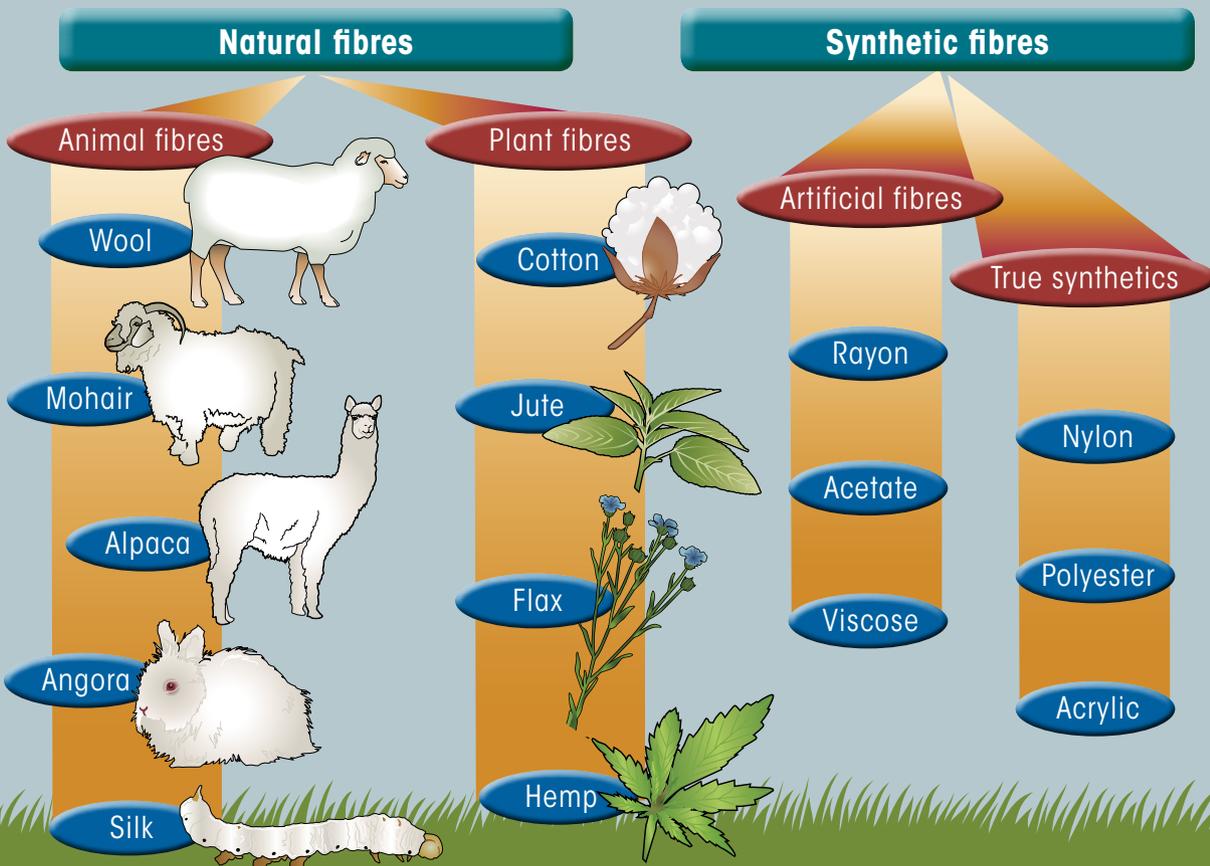
- wool from sheep
- mohair from angora goats
- alpaca fleece from alpacas
- silk from silk worms
- rabbit wool from angora rabbits.

Plants that supply fibre include:

- cotton
- flax
- hemp.

Natural fibres are **biodegradable** and come from **renewable resources**. If something is not biodegradable, it cannot break down and stays in the same form a for a very long time. When things cannot be broken down, they pollute the environment.

As biodegradable products break down they add nutrients to the soil.



ARTIFICIAL FIBRES

Artificial fibres, such as rayon and acetate, are made from carbon containing compounds (tiny parts) called cellulose found in wood pulp. Although wood pulp is a "natural substance", rayon and acetate are not natural because of the processing involved in making them.

SYNTHETIC FIBRES

True synthetics are made from petrochemicals (oil-based substances). The first true synthetic produced was nylon.

Synthetics are made by melting or dissolving the material and drawing it into a long thread by pushing it through tiny holes in a plate (spinneret).

Synthetics are popular because generally they cost less to make.

They can be durable and lightweight, but have poor insulation qualities and low fire resistance.

Many synthetic fibres melt when they come into contact with flames. In some products, like children's pyjamas, this can be very dangerous.

FASCINATING FACT

The first artificial fibre – artificial silk – was produced in 1855. It was called rayon. The first true synthetic – nylon – was made in 1939. Nylon was used for fishing line, surgical stitches, toothbrush bristles and later, more famously, for nylon stockings.



WHERE CAN I BUY WOOL PRODUCTS?

Wool clothing is available at most clothing outlets. Many sports and outdoor stores stock a range of Merino sports clothing. If they do not have wool products, ask them why not? Good curtains and linen stores should have a range of woollen items like duvets, pillows and blankets.



Hand dyed wool and products by Cowgirlblues

Wool duvets made by Sneeuberg



Clothing sold in South Africa from fine Merino wool



HOW TO FIND QUALITY WOOL

South Africa was one of the founding members of the International Wool Secretariat (IWS). This organization promoted wool all over the world and established the highly recognizable Woolmark.

In 1997 The IWS merged with an Australian wool organization and became The Woolmark Company. It is the global authority on Merino wool. It also owns the Woolmark brand and licenses the use thereof.

The woolmark logos tell consumers what sort of wool products they are buying.



WOOLMARK This means the item is made with 100% wool.



WOOLMARK BLEND This means the item contains a minimum of 50% wool.

CARING FOR WOOL

Wool products are easy to care for but one must always check the label to see exactly how to do this. If you follow the care instructions your wool products will stay in a good condition for many years. After wearing wool clothing always air it, or wash it according to the label instructions. Brush off or treat any dirt and stains immediately.

Always empty pockets before putting clothing away, or else the pockets can bulge and stretch and become sloppy, far from its original shape. Sometimes it is better to dry certain pieces of clothing by putting them flat, rather than hanging them, which can cause stretching.

Some wool products need to be hand washed and some are best dry-cleaned. Some can be machine washed. Usually, wool is best washed in lukewarm or cold water (never hot!) to prevent it from shrinking.



Use the wool setting when ironing and washing woollens



CARE INSTRUCTIONS ON CLOTHING LABELS

Some clothing labels have symbols which tell you how to care for your garment. Here are a few. See if you can find some more.

- Handwash only
- Must be professionally dry cleaned
- Wash on wool setting
- Iron at medium heat (or wool) setting
- Do not bleach
- Tumble-dry on low heat setting

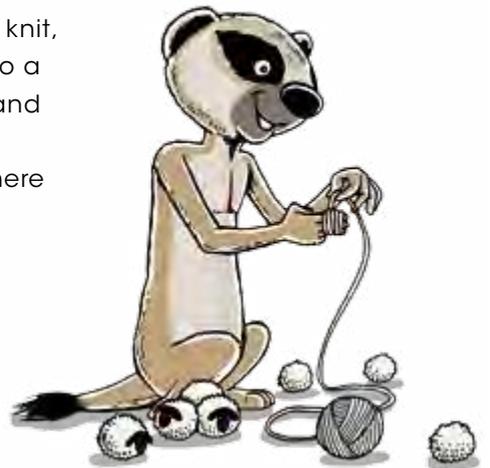


Wool felt slippers

WHAT CAN I MAKE WITH WOOL?

Knitting is very easy once you get the hang of it. If you cannot knit, get an adult to teach you. Start by learning to cast stitches onto a knitting needle and then practise the two basic stitches: purl and plain. Even with these basics you can make beanies, scarves, jerseys, blankies, soft toys and cushions. The list is endless. If there is no one in your family to help, try your school or local library. The internet also has various sites to teach beginners.

On the next pages are two items to make: a pompom pet and a little knitted Merino sheep. Keep it for yourself, your classroom or make it as a gift for someone. Not only children, but adults will simply adore them. Once you've practised and your product looks good, why not sell or trade it?



POMPOM PET

This is what you will need:

- coloured wool
- cardboard
- scissors
- pencil
- cups or bottles for tracing circles
- glue
- bits and pieces like pipe cleaners, toothpicks, bottle tops, beads, buttons and scrap material for finishing touches and/or decoration.

Get everything you will need together before you begin. If you feel unsure ask an adult to read through the instructions and help you through them, one at a time.

This is what you do:

1. Take a cup or bottle (or a pair of compasses) to trace the outline of a circle on a piece of stiff cardboard.
2. Trace a smaller circle in the first one. This creates a ring, which looks like a doughnut. Cut two of these. Place one on top of the other. Now you have one thick "doughnut" ring.
3. Cut about 1 metre of wool. Wrap tightly around the thick "doughnut" ring. Stick to the round shape. You can wind your wool into a small ball and thread through the hole as you work.
4. Repeat step 3 until you can fit no more wool through the hole in the rings.
5. Use the scissors to carefully cut the wool between the cardboard rings. You may need an adult to help you.
6. Tie a length of wool very tightly between the two cardboard rings. Knot the two loose ends of the wool. Carefully remove the rings.
7. Fluff out your pompom and cut off any pieces that stick out too much.
8. Now use all sorts of bits and pieces like pipe cleaners, toothpicks, bottle tops, fabric scraps, buttons or beads to give your pompom arms or legs (or both), eyes, ears, a smile – even a hat.
9. If you make two or more pompoms you can tie them together to make different types of pets.



MERINO SHEEP

©DANA BIDDLE

This is what you will need:

- 50 gram chunky (thick) Merino wool, or a similar wool blend yarn in a natural colour.
- scraps of smooth yarn for the face
- 30 grams stuffing
- 5 mm knitting needles
- wool or tapestry needle
- scissors

This is what you do for the sheep's body:

1. Cast on 30 stitches.
2. Knit 40 rows in garter stitch (this means knit every row).
3. Before you cut the yarn, leave a long tail of about 30cm.
4. Take the tapestry needle and thread it through the stitches left on the knitting needle.
5. Remove the knitting needle, pull the thread tight to gather the end.
6. Stitch the seam where the edges meet, all the way to the other end.
7. Stuff the body lightly.
8. Thread a gathering stitch around the edge of the open end, pull tight and end off.

Sheep's head

1. Cast on 14 stitches.
2. Knit 4 rows.
3. Next 2 rows: Cast off 3 stitches and knit to the end of the row.
4. Knit 12 rows.
5. Cast off.
6. Cast on 14 stitches.
7. Row 1: Knit
8. Row 2: Purl 3, knit to last 3 stitches, purl 3
9. Row 3: Knit
10. Row 4: Purl 3, knit to last 3 stitches, purl 3
11. Row 5: Cast off 3, knit to the end of the row
12. Row 6: Cast off 3, purl to the end of the row



13. Work 12 rows in stocking stitch (this means knit one row, purl one row).
14. Cast off.
15. Stitch the 2 halves of the head together. Leave a space for stuffing. Stuff the head lightly. Be careful not to stuff the ears.
16. Close the seam.
17. Position the head on the front of the body, over the hole left from gathering the edge. Stitch to hold it in place.

Tail

1. Cast on 14 stitches.
2. Knit 6 rows.
3. Cast off.
4. Position the tail on the back of the body. Stitch to hold it in place.

Legs (You have to make 4.)

1. Cast on 6 stitches.
2. Knit 6 rows.
3. Before you cast off, leave a tail of about 20cm. Cut yarn
4. Thread yarn around the edges of the square and gather up.
5. Position the legs on the bottom of the body and stitch to hold in place.

(For our sheep we used pure handspun Merino wool from ColourSpun, in a natural colour. It is available from Dana Biddle, a fibre artist, pattern developer and provider well-known in the world of craft and fabric. Go to her website to order wool or simply marvel at the beautiful objects she creates: www.colourspun.com)

WOOLLY SCIENCE

You will need:

- 2 containers of exactly the same size. They must be able to hold about 250 – 300 ml
- a woollen sock big enough to hold one of the containers
- a small measuring jug
- 2 identical glasses
- water
- access to a freezer

Easy step by step instructions:

1. Label one container "wool" and the other one "control".
2. Fill the containers with the same amount of water.
3. Put the containers in the freezer. Leave them overnight.
4. Take the containers out of the freezer. Put one in the wool sock and tie the top of the sock with a piece of string or elastic. Leave both containers somewhere safe. (Make sure that it does not leave a water stain on a table or shelf!)
5. Wait for about 1 hour. Now carefully take the container out of the wool sock.
6. Look at both containers. What do you notice?
7. Pour any water in each container into the 2 glasses. Look at the water levels in each glass.
8. Pour the water of the first glass into the measuring jug. Write down on a piece of paper exactly how much water you measure. Discard (throw out) water. Now pour the water of the second glass into the measuring jug. Again record the exact amount of water.



HOW DOES THIS WORK?

Wool is a good insulator. The container that was put into the wool sock stayed cold because the wool insulated the ice. In other words it didn't melt. (The surrounding temperature outside and wherever it is you are doing this experiment will affect the speed of the ice melting.) The container without the sock had no insulation, so more of the ice melted.

WOOLLY WONDERS AND FLEECY FACTS

Since ancient times wool has played an important role in many cultures and traditions. It has been used widely for clothing, bedding and housing material.

Wool and ancient history

The story of wool started before recorded history. Primitive people clothed themselves in the woolly skins of the wild sheep which they hunted and killed for their meat. The coat of the sheep, they discovered, was durable (hard-wearing) and versatile (it could be changed for many different functions). It was like no other fibre they knew. It kept them cool during the heat of the day, but also warm during cold nights.

What's more, it could also absorb moisture without feeling wet on the skin.

Primitive people had already domesticated (tamed and kept for produce) sheep in 10 000 BC. But even before this woollen cloth was being spun and woven by the tribes of northern Europe.



The Golden Fleece

In Greek mythology the story of the Golden Fleece is well-known. The fleece of gold came from a ram who had a long and interesting name, Chrysomallos, and he had wings (lucky guy!).

According to the myth Jason, leader of the Argonauts (a bunch of Greek heroes), went in search of the magical ram's fleece to win back the throne of Ilocus for his father, King Aeson. But first he had to dethrone his uncle, Pelias. In order to do this Jason and the Argonauts had to go on a dangerous journey to claim Chrysommalos' fleece of gold, which was guarded by a dragon. After many challenges Jason and the Argonauts returned with the fleece and his father was returned to the throne.



Myths are very old traditional stories, often about supernatural beings or events. People heard these stories and repeated them to their children, their grand-children and other people. The purpose of myths is to help us understand emotions, behaviour, nature, history and life in general. Every culture has its own myths and together all the myths are called mythology.



Military wool

Wool has been used for the uniforms of soldiers since ancient times. Ancient Greeks lined their helmets with wool felt and Roman legionaries (members of a division in the ancient Roman army) used felt to make their breastplates. Felt is a soft fabric made by rolling and pressing wool (or any other suitable fibre) while applying moisture and heat, which causes the fibre to mat together.

Modern military uniforms include items like undershirts and vests made from lightweight and wool-blended fabric.

Shrek

Named after the comic character Shrek, a New Zealand Merino wether, became internationally famous after he avoided being caught and shorn for six years by hiding in caves.

After he was caught on the 15th of April 2004 he was shorn in only twenty minutes. The shearing was broadcast on New Zealand's national television. His fleece contained enough wool to make vests for twenty men. Thereafter he was taken to the New Zealand parliament to meet the prime minister.

Shrek became a hugely popular New Zealand icon. He died when he was about sixteen years old. (By the way, the *Shrek!* book, movies and musical are not related to *Shrek* the wether.



The longest staple

An Australian wether was found in New South Wales (a part of Australia) after being lost in the bush for five years. After he was shorn the wool staple was 460 mm long.

Baseballs

Wool is used in the making of traditional American baseballs. An inner core of cork or rubber is wrapped tightly in about 200 meters of woollen yarn – first a layer of 4-ply wool, followed by two layers of 3-ply wool. The wool gives the ball its springiness. This is then covered with a stitched leather casing. You will find interesting video clips on the internet to see how a baseball is made.



More about wool bales

All wool bales are a standard 750 mm wide and 750 mm deep. The wool presser ensures an exact size. Once filled and pressed the bales are closed at the top.

The South African wool industry has standards to guarantee that all bales are prepared in the same way. It simplifies handling and transport. Filled bales cannot be higher than 1 250 mm and must weigh between 110 – 180 kg. Depending on the size of the sheep, it takes about 50 skirted fleeces to fill a bale.

Most of our wool is exported on ships. To reduce the amount of cargo space needed standard wool bales are compressed and bound with steel straps. These export bales are then packed into ship containers for transport. Compressing the standard bales means one container can fit up to 96 bales of wool or about 15 tonnes of wool.



Egypt

Wool was dyed a variety of colours – including red, blue, yellow and green – during the Middle Kingdom (2040 BC to 1640 BC). Its use became widespread in the Graeco-Roman era. It was valued for making clothing that was not only protective, but also pretty.

WOOL AND LANGUAGE

Before paper (which was invented by the Chinese long before we caught on) writers and readers mashed up papyrus plants to make a flat surface which looked and felt a bit like paper. (Do you see the link between the words papyrus and paper?)

But when a chap called William Caxton built the very first printing press in England in the 15th century it was made for the size and shape of a sheepskin. A sheepskin is

more or less rectangular in shape when dried and stretched. "When paper was finally introduced it was manufactured to fit the existing printing presses, and that's the reason that both the text you're reading and the book that contains it are dependent upon sheep," explains Mark Forsyth in his book about the English language. (*Ethymologicon - a circular stroll through the connections in the English language.*)

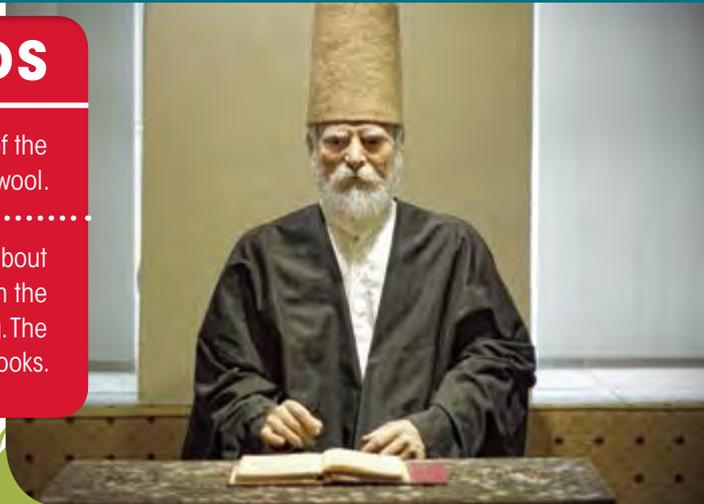


William Caxton showing specimens of his printing



WOOLLY WORDS

- Muslim mystics are called sufis, probably because of the woollen garments they wore. Suf is Arabic for wool.
- If you are on tenterhooks you are excited and anxious about something which still has to happen. The word comes from the wooden rack, a tenter, used for stretching sheepskins for printing. The sheepskin was kept tight and flat on the tenter with tenterhooks.



OTHER ENGLISH SAYINGS RELATED TO WOOL

- To make sheep's eyes at someone, or to throw a sheep's eye at someone = To be in love.
- A wolf in sheep's clothing = Someone/ something pretending to be what they are not. (It comes from the Bible, Matthew 7:15)
- To separate the sheep from the goats = To judge. (Matthew 25:32)
- The black sheep of a family/group = The one who is regarded as a disgrace to that family/group.
- Like lost sheep or like sheep that have strayed = To be without leader (Bible, 1 Peter 2:25)
- To be as gentle as a lamb = To be kind and careful; not rough or violent.
- Someone is a lamb = Someone is mild-mannered, gentle or innocent.
- To be led like a lamb to the slaughter = To move towards danger without any form of resistance. (Derived from the Bible: Isaiah 53:7)
- To pull the wool over someone's eyes = To deceive someone.
- If you are a sheep you are someone who is too easily influenced and led by others.
- The people in a church minister's congregation are often referred to as his flock, or his sheep.



Baa baa goes digital ...

In 1951 the well-known English nursery rhyme "Baa, baa, black sheep" was one of the first two songs ever to be digitally saved and played on a computer. (The other song was "In the mood".)

This children's rhyme was first printed in *Tommy Thumb's Pretty Song Book* in 1744. This is the oldest surviving collection of English language nursery rhymes. The lyrics (words) were nearly exactly the same as those sung by toddlers and pre-schoolers all over the world today.

Some historians say the song was originally written to complain about the heavy taxation on wool in Medieval England. Other source say it refers to the slave trade.

Baa, baa, black sheep,
Have you any wool?
Yes, sir, yes, sir,
Three bags full;
One for the master,
And one for the dame,
And one for the little boy
Who lives down the lane.



Wool producers manage their properties to minimise any impact on the environment

DOES WOOL PRODUCTION AFFECT THE ENVIRONMENT? ...

South African wool-producing families have often been on their properties for many generations. Looking after the environment is as important for them as it is for the consumers who buy their wool.

Sheep are not **indigenous** to South Africa and do not eat the same plants as our indigenous animals (like springbok or elephants for instance). Therefore wool producers have had to change some areas of the natural landscape to produce enough wool for consumers both here and abroad.

Wool producers consider many things when they manage their properties. These include livestock, land, existing indigenous plants and animals as well as the changing climate.

To protect and preserve the environment for future generations, wool producers manage



their soils, pastures, livestock and indigenous veld carefully. They work with researchers and advisors to find better ways to manage the land and still supply consumers with the products they need.

Wool processors also consider the environment during wool processing. They are careful to manage and minimise any waste products and ensure they always use chemicals safely.

SOIL MANAGEMENT

Soil has to be healthy to grow productive pastures to feed sheep. Wool producers manage their soil very carefully because it is one of their most important natural resources.

Some of the methods used by the first farmers in South Africa had a negative impact on our soil. The methods were introduced by early settlers from Europe and did not suit the South African environment. The result, in large parts of the country, is poor soil, low in **nutrients**, and depleted of natural shrubs, bush, grass and/or trees. This can cause terrible erosion.

Erosion is the wearing away of soil, rock or sand by water or wind, with the result, when it does rain, the water simply runs away and does not penetrate and feed the earth. It can also result in flooding and the death of both people and animals.

Wool producers have been working with researchers for decades to find better ways to manage South African soil. Our soils are often acid, saline (salty) and easily eroded. Producers know this very well and manage these factors very carefully.

SOIL ACIDITY

Acid soils can be toxic (poisonous) to many pastures and crops.

Slowly over time soil naturally becomes acidic. But certain activities can cause soil to become acidic more quickly.

South African soils are often low in nutrients and producers need to add fertilisers to provide enough nutrients for pastures and crops to grow.

Adding nitrogen fertiliser to the soil can increase acidity. Wool producers also add nitrogen when they grow legume crops and pastures, and when they remove pastures

through grazing or hay production, or grain at harvesting.

Some of the nitrogen from these activities changes to nitrates and acid in the soil. If plant roots absorb the nitrates, the rate of **acidification** is slow. If plants do not use the nitrates they can leach (leak) through the soil, leaving it more acidic.

Wool producers manage soil acidity by using appropriate rates of fertiliser, choosing deep-rooted perennial pastures to absorb nitrates and adding lime to the soil to counteract the acidity.



FASCINATING FACT

Soil acidity is measured on a pH scale. An acidic soil could have a pH of 3.5, a neutral soil 7.0, and an alkaline soil 8.5.

Mr Malusi's soil management plan

- monitor soil acidity with regular soil tests
- develop a lime application programme for camps with falling pH levels (in other words, rising soil acidity)
- apply fertiliser to match crop and pasture needs
- use **perennial pastures** to help manage excess soil nitrogen produced by legumes such as lucerne and clover
- minimise product removal to maintain groundcover by retaining crop stubble and feeding hay and silage back into camps where possible.



SALINITY

Dryland salinity is the movement of salt from deep in the ground to the soil surface.

Salt in the groundwater and on the soil surface can enter waterways such as rivers and streams. This can affect the health of the waterways and the creatures in them.

TYPES OF SALINITY

Salinity can occur naturally but it can also be increased by human activities. In dry environments, natural soil and water salinity is more common. Most plant species in these areas have adapted to the natural salt levels over time and grow well.

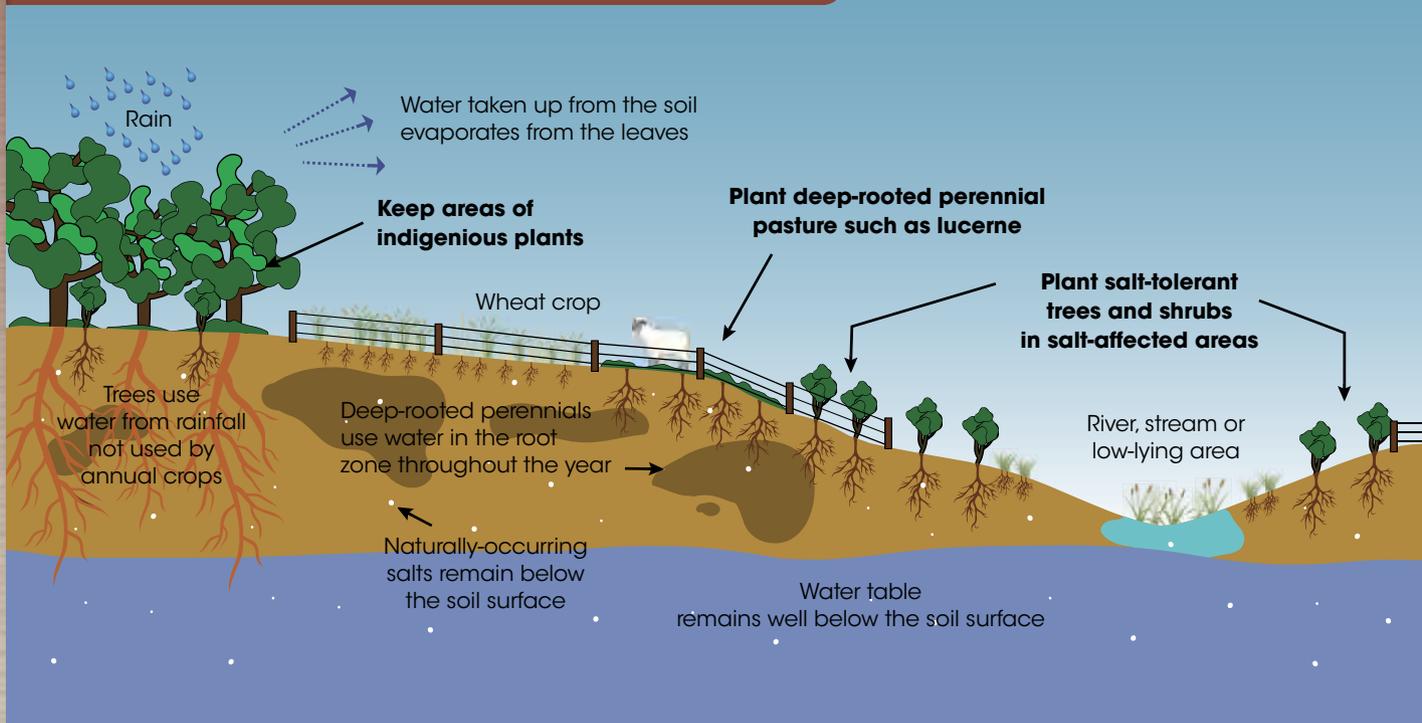
Salinity can be caused by human activities. This can occur when **annual crops** and pastures replace perennial plants.



Annual plants do not use as much water as perennials. This causes the water table (underground water) to rise. As the water table rises, it brings salt to the soil surface.

Many plant species growing in areas with increasing salinity cannot cope with rapidly rising salt levels.

How wool producers manage dryland salinity



HOW IS SALINITY MANAGED?

Wool producers manage salinity by maintaining areas of indigenous veld. They also plant trees and shrubs around cleared camps. These trees and indigenous plants use rainfall not needed by annual plants. This keeps the water table well below the soil surface.

Many wool producers also grow deep-rooted perennial pastures such as lucerne.

These pastures use water throughout the

year, unlike annual crops which only use water during their growing season.

Researches are looking for more perennial pasture species that are suitable as sheep fodder. This will give wool producers more plants to choose from. It will also ensure that there are suitable plants to grow in a range of different areas.



FASCINATING FACT

Climate change combined with an increased use of perennial pastures, such as lucerne, is reducing the risk of dryland salinity spread in some areas.

Mr Malusi's dryland salinity plan

- retain areas of indigenous veld
- plant perennial shrubs and trees around camps or as a plantation
- grow deep-rooted perennial pastures.

SOIL EROSION

When heavy or constant rain and/or wind moves soil it can result in erosion. Plant roots help hold soil together. When plants are also removed, the chances for erosion increase. Plants also offer protection from the wind. In natural environments, perennial plants cover and protect the soil from wind and water throughout the year.

Rain can easily flow down sheep tracks and wash away (or erode) the soil. Grazing for too long can expose soil. Therefore producers do not allow sheep to graze just anywhere. They move sheep from one camp to another to ensure enough pasture is left to cover the soil surface. This prevents overgrazing and erosion.

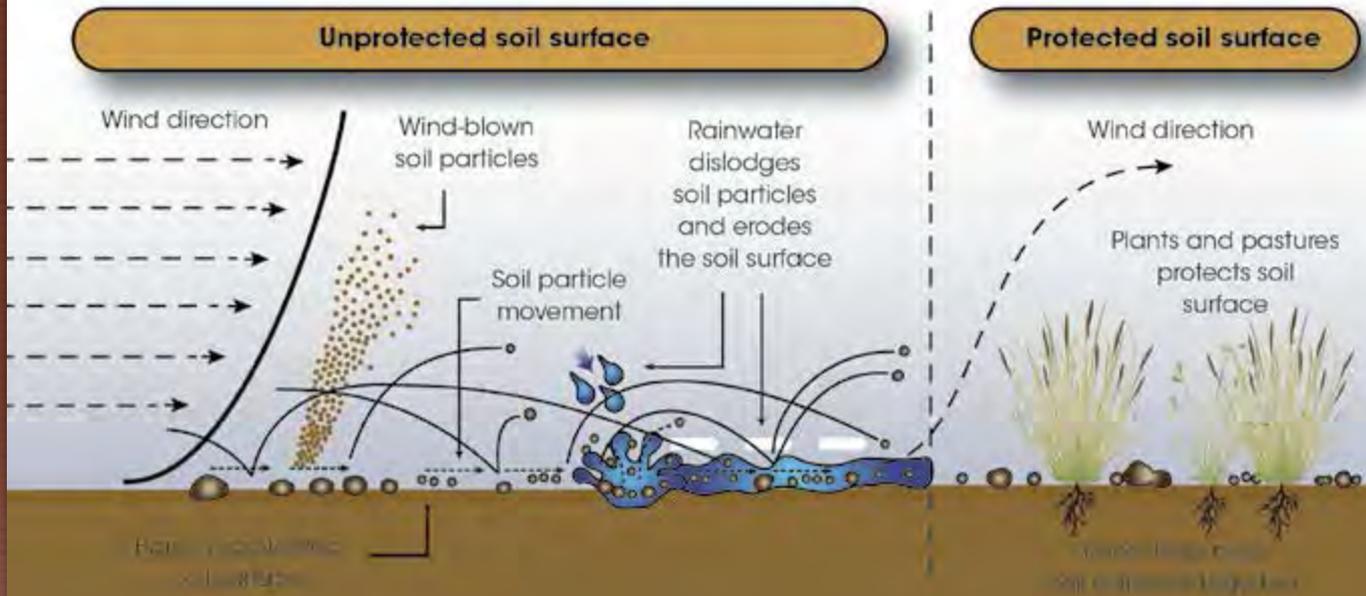
Wool producers also plant perennials not only as fodder but also to protect the soil year-round.



Managing flocks in different camps

Overgrazing can cause soil erosion





How soil erosion occurs and how plants protect the soil



Mr Malusi's soil erosion management plan

- plant perennial pastures to protect the soil year-round
- manage grazing to ensure there is enough pasture left on the soil surface to protect it from wind and water erosion
- plant shrubs and trees around camps to protect them from wind erosion.

FASCINATING FACT

Many producers plant rows of trees and shrubs called "windbreaks" to protect their camps from wind erosion. A mature windbreak can reduce the speed of the wind by up to 70%.



WASTE MANAGEMENT

Wool producers aim for minimal environmental impact. Wool scouring removes dirt and grease from dirty wool leaving clean wool and waste water. Further processing after scouring also produces waste, which is carefully managed to prevent environmental problems.

Waste water contains all the contaminants cleaned out of the wool. It consists of three main parts:

- strong flowdown
- rinse water
- dry waste.

Strong flowdown is a mixture of wool wax, dirt and suint (sheep sweat). Suint has high potassium levels. This can cause nutrient enrichment problems in the natural environment, such as excess **algae** growth in wetlands.



Wool processors recycle and treat waste water to minimise impacts on the environment



Waste water is stored and reused during processing

Rinse water is mainly dirty water. Dry waste is dirt, dags (sheep manure stuck to wool) and vegetable (plant) matter removed from the fleece.

There can also be pesticide residues in the wool from chemicals used to control parasites such as lice.

To prevent wool scouring from damaging the environment, the residues are treated. Rinse water is cleaned by filtering and chemical treatment. About 90% of it can be recycled, which reduces the amount of water needed in wool processing.

The flowdown is treated with chemicals and evaporated. Sludge and dry wastes can be composted and recycled as fertiliser.



Lanolin is used in many skin products



WONDERFUL WASTE

Some useful products are made from the residue left over from wool scouring. Lanolin is wool grease and is used in many moisturisers. Liquid fertiliser can be made from the **potassium**-rich waste. Compost for gardens is made from the dry wastes and sludge.



MOTHPROOFING

Wool is a natural protein fibre. You and I do not think of it as a source of food, but some species of moths and beetles simply love it.

Wool carpets are treated before selling to



New moth treatments are environmentally safe

prevent this occurring. Treated wool carpets are safe to use but some treatment processes can cause harmful waste. New processes have been developed that cause virtually no waste discharge.



FASCINATING FACT



Before modern synthetic dyes were developed, plant materials (eg. roots, berries, barks and leaves) and minerals (eg.) were used to colour wool. Some old plant-based dyes are now being investigated for their potential to be used again in modern wool processing.



DYEING

Wool is usually dyed to produce the colours consumers want. Many dyes contain heavy metals such as chromium. Chromium makes colours fast. This means it makes the colour stay in the wool, and prevents it from washing out and fading. Unfortunately high levels of chromium in the environment can be harmful.

Wool processors and dye manufacturers have worked together to produce low-chrome effluent (waste) techniques for dyeing wool. These improved techniques are now used widely.



Wool dyeing has been changed to use less harmful chemicals

SHRINK RESISTANCE

Wool fibres can shrink and felt (become dense and matted) when washed and untreated. To prevent this, wool is chemically treated during processing.

In the past chlorine was used in this process. Chlorine, however, caused effluent

(waste) to be produced containing harmful chemicals called organohalogenes.

Luckily new chlorine-free treatment methods have been developed that do not produce organohalogenes. These new methods minimise the impact on the environment.

HOW DOES CLIMATE CHANGE AFFECT WOOL PRODUCTION?

Climate change concerns many people, for different reasons.

We see the changes around us. An example is the change in rainfall patterns.

All agricultural production, including wool production, relies on the climate. Therefore climate change affects wool producers. It is difficult to know exactly what the long-term effects will be.

Scientists use computers to make predictions based on what they know about climate and wool production. Most of them agree that climate change will probably affect pasture growth. More carbon dioxide in the atmosphere could make plants grow faster – but contain less nutrients.

Less rain can mean the following:

- less plant growth
- the types of plants farmers use to feed their sheep might change
- some weeds becoming more common
- less water for sheep
- fewer sheep could be grazed in certain areas.



WOOL QUALITY

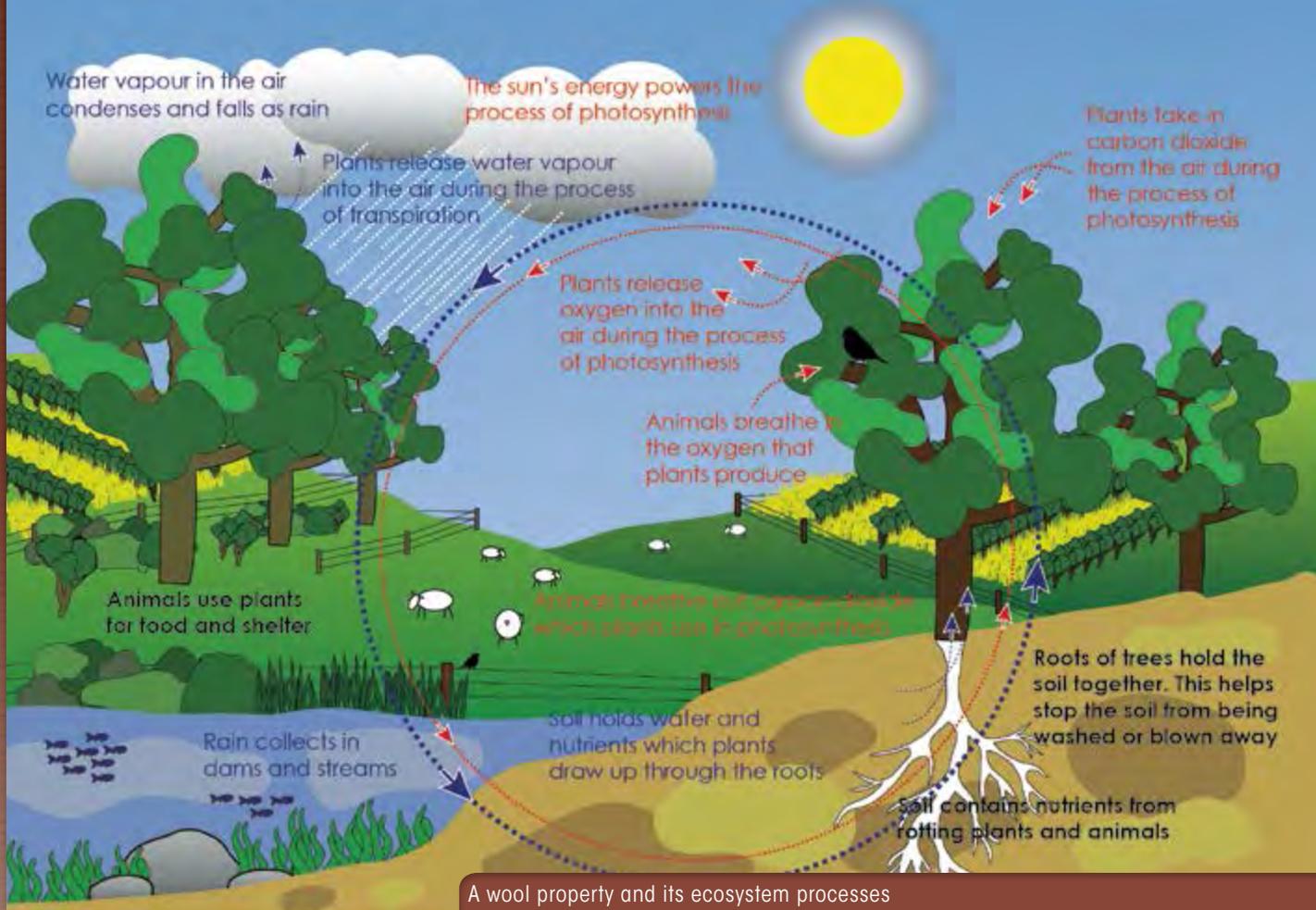
Climate change may also affect the quality of wool. More periods of drought may mean dirtier wool – there will be more dust.

The amount of pasture available can affect wool fibre diameter.

The good news is that climate change

could cause an increase in the demand for wool. As temperatures rise it may mean people choose wool to keep cool. We may also use more wool products to insulate our homes against the warming climate.





HOW DOES WEATHER AFFECT WOOL PRODUCERS?

The climate and weather are important to wool producers because all farm activities are planned around the seasons.

Producers have to plan activities like lambing and shearing for just the right time of year to produce the best possible wool.

The weather and seasons vary from one

year to the next and these changes can seriously affect production activities. Rainfall and drought in particular have large impacts on wool production matters.

Sudden severe weather events, like unexpected cold snaps, can reduce the wool quality and even cause animal deaths.

RAINFALL

Rainfall provides water for pastures and fodder shrubs to grow and thrive. The amount of food available to sheep is largely determined by how much rain falls.

The amount of rain and when it falls is equally important. Out of season rain can cause problems. If it falls unexpectedly producers often have less feed available for their sheep than expected.

Sheep are adjusted to survive in harsh conditions such as rain, frost and snow. On p5 you learnt that wool is a good regulator of heat and is also water resistant. Sheep therefore carry their own natural protection.

But newly shorn sheep (and young lambs) need protection from snow, cold winds, frost and rain.

Wet sheep should not be shorn. Farmers are

WEATHER WARNINGS



Wool farmers use their cellphones, the internet or keep a close eye on television weather forecasts. Reliable weather forecasters send warnings about approaching storms to The National Wool Growers' Association (NWGA). These are immediately sent to wool farmers via sms to take the necessary precautions, especially during the shearing season.



encouraged to move enough sheep for a day's work to sheds or a protected area in a kraal, the day before. If rain continues, farmers and shearers simply have to wait. Wet wool may not be baled. It will become mouldy.

DROUGHT

Drought can have a significant impact on sheep health, wool and pasture production and therefore general wellbeing on the farm. During a drought less rain falls. It could result in too little water for all the farm activities, including drinking water for stock and water for pastures and crops to grow.

Periods of drought mean there is less feed and water available for sheep and producers may choose to "buy in" food and water. In this way they can maintain the health of their animals and the quality of the wool they produce.

Buying feed can be expensive. The price of feed, like hay and grain, often increases during drought because the demand is high (many producers need it at the same time) and there is therefore less available. Water can also be expensive and difficult to transport.

During drought producers may sell some sheep. Many years of drought can reduce national sheep numbers and it can then take producers a long time to rebuild their flock numbers.

Researchers work with wool producers



Supplementary feed can be expensive to buy



Researchers and wool producers are working together to develop pasture species that can survive in dry climates. These plants help wool producers to manage droughts and keep their sheep and pastures healthy.

GLOSSARY

acidification – the process through which soils become acidic (pH low).

algae – a type of water plant.

antibodies – types of proteins that help fight disease.

annual crops – crops like wheat, barley, maize, sunflower and canola that grow only for one season and then die.

auction system – a method of selling wool where a number of interested buyers bid (offer a certain price) and the winner is the person who offers the highest price.

bacteria – single-celled organisms, some of which can cause disease in animals (and humans).

biodegradable – capable of being broken down by bacteria and other living organisms.

bloated – a condition in sheep where too much gas builds up in the rumen (the sheep's first stomach).

breech – upper part of the back legs, close to the tail area.

calcium – a nutrient that provides goodness to plants, animals (and humans) for healthy growth.

castration – removing of the testicles of male lambs not needed for breeding.

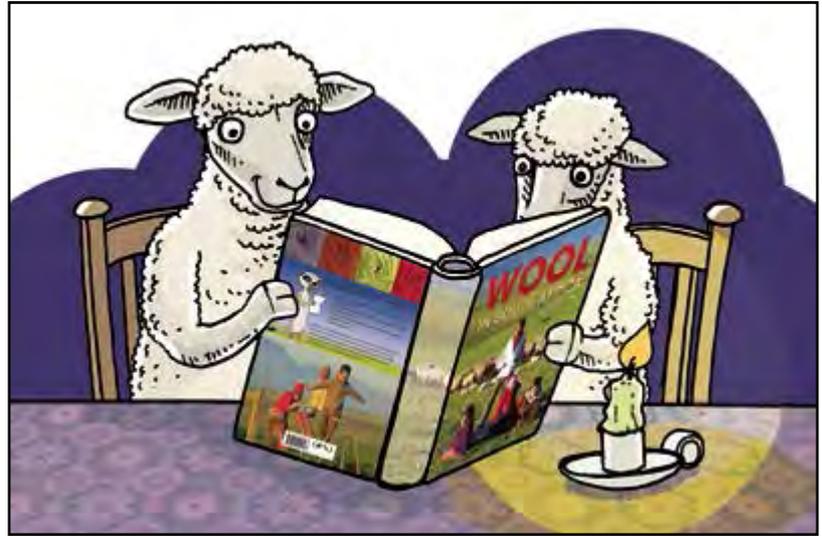
catching pen – shearers take their sheep from this small, enclosed section in a shearing shed for each shearing. Shearers usually have their own catching pen.

commercial – producing wool to sell to consumers.

crutching – removing wool from a sheep's bottom area to keep it clean and free from wet manure.

cud – partially digested food that a sheep has regurgitated for further chewing before final digestion.

domesticated animals – animals that have been tamed to live alongside humans or livestock, like dogs.



drenching – giving a worm-control chemical to sheep to kill any worms that may be living inside the sheep's digestive system.

environment – the area around us. It includes the soil, water, air, plants and other organisms.

ewes – mature female sheep that are used for breeding and wool production.

exotic diseases – diseases that exist in other countries, but not in South Africa.

export – sell goods and services to another country.

fleece – the wool that covers the body of a sheep, usually removed at shearing.

flocks – a group of sheep, also called a mob.

foetus – developing young inside the womb.

genetic – refers to genes, heredity and that which is transferred from parent to offspring.

genetic disorders – illnesses that are passed from one generation to their offspring.

graze – feed on pasture or shrubs.

greasy wool – raw wool that has not yet been cleaned and processed.

hay – pasture that is cut, dried and baled to feed stock when pasture is limited.

hoggets – immature male and female sheep. They are older

than weaners but are not fully-grown adult sheep.

indigenous – occurring naturally in a particular place

improved pastures – pastures that have been planted with high-quality species and possibly fertilised.

insecticides – chemicals that kill insects.

integrated parasite management – a way of managing livestock to control parasites. It consists of various control options such as rotational grazing, drenching and breeding programmes.

intestine – the lower part of the digestive system.

introduced species – species that have been brought to South Africa from another country.

jettling – spraying sheep with an insecticide to control lice or blowflies.

lactating – producing milk to feed offspring.

lambs – young sheep (female and male) less than 6 months old and still dependent on their mother for food.

legumes – plants that produce nitrogen in tiny nodules around their roots.

locks – short wool pieces created by shears cutting twice over the same area.

livestock – animals used in agricultural production such as sheep, cattle, goats and pigs.

- mammals** – vertebrate, milk-producing animals, usually with four legs and hair or fur. Most of them give birth to live young.
- marking** – gathering sheep together to castrate, tail dock, vaccinate, earmark and tag in a single operation.
- metabolic disorders** – diseases caused by an imbalance of normal chemical processes in the body.
- microbe** – a tiny living being, a micro-organism.
- monopoly** – the exclusive control of trade in goods or service.
- native animals** – animals that originated in South Africa, like the white rhino, blouwildebeest and kudu.
- native pastures and plants** – plants that are found naturally in South Africa and have not been brought in from another country, like fynbos.
- necks** – short parts of the fleece that are taken from around the neck area.
- nutrients** – a substance that provides nourishment essential for life and growth
- open-cry auction** – an auction system where buyers shout out what they are willing to pay and the highest bidder wins the wool that is up for sale.
- ovary** – the part of the female reproductive system where the ova (eggs) are produced.
- pathogens** – bacteria, viruses or other micro-organisms that can make animals (and humans) sick.
- parasites** – animal such as lice or worms that live on or inside another animal. Parasites can make animals (and humans) sick.
- perennial** – that which grows for more than one year.
- pesticide** – product used on plants or animals to destroy insects and other pests.
- pieces** – stained, short or sweaty edges that are removed from fleece during skirting.
- potassium** – a nutrient that provides goodness to plants and animals for healthy growth.
- producer co-operative** – a group of producers who pool their wool and sell it together.
- protein** – a nutrient that helps build and repair body cells.
- quarantine** – areas where plants or animals are isolated to prevent the risk of spreading disease to other plants or animals.
- race** – a narrow passageway in sheepyards for sheep to run through.
- rams** – mature males that have not been castrated and are used for breeding.
- renewable resources** – resources such as sheep, pasture and trees that can be replaced or regrown after they have been consumed or harvested.
- roving** – the wool top after it has been stretched by the drawing process.
- selective breeding** – choosing certain animals to breed with to produce offspring that have desirable qualities, such as finer wool.
- semen** – the material produced by a ram that contains sperm.
- shearing** – removal of sheep's fleece using mechanical or hand-powered clippers (shears)
- silage** – green fodder (pasture or crop) that has been conserved so it can be fed to livestock at a later date.
- sliver** – a long even web of wool produced by the carding process.
- sodium** – a natural metallic element in salt. It is essential for living organisms.
- sperm** – male reproductive material. If this does not fertilise eggs from a female, offspring cannot be produced.
- staples** – a cluster of wool fibres
- superfine wool** – wool of 19,5 microns or less.
- supply chain** – the line of activities from the farm to the retailer including production, processing and resale.
- top** – wool that has been carded and combed to make the fibres line up in the same direction. It is now ready for spinning.
- troughs** – large containers that hold water for sheep to drink. Water is often pumped into troughs through pipes from a larger water source such as a water tank, dam or river.
- vaccination** – the process of giving a vaccine to protect an animal (or human) against a certain disease.
- value added (products)** – products that have extra or special features. Consumers are prepared to pay more for this.
- vertebrates** – animals with backbones.
- viruses** – microscopic organisms (so small you can see them only through a microscope) that live and reproduce inside the cells of another organism.
- wage** – regular money that employees (workers) receive for doing their job. A wage is usually paid weekly or every second week. (Unlike a salary usually paid once a month.)
- weaned** – lambs are taken away (separated) from their mothers and get all their food through grazing.
- weaners** – young sheep (male and female) recently removed from their mothers.
- wethers** – mature male sheep that have been castrated so they cannot breed. Wethers are used for wool production.
- woollen system** – system of wool processing where shorter fibres of wool are processed.
- wool clip** – all the wool harvested from shearing. Usually from a single property (farm.)
- wool brokers** – people who trade wool on behalf of wool producers.
- wool packs** – large nylon bags that contains fleeces ready for transport and sale.
- worsted system** – system of wool processing where long fibres of wool are spun into yarn.

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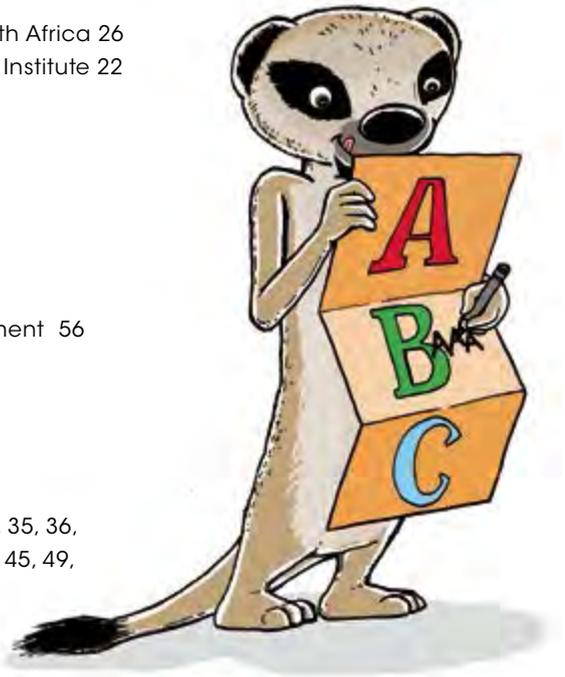
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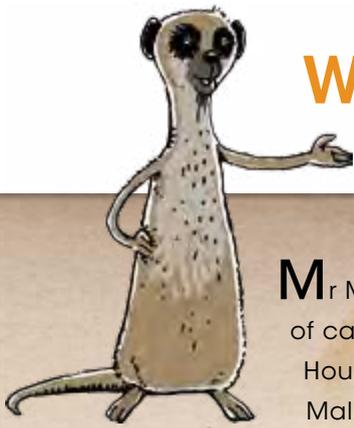
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WHO IS MR MALUSI?



Mr Malusi is a creation of cartoonist Alex van Houwelingen. He based Mr Malusi on a real meerkat,

Mr Koer, who became part of a farming family in the Karoo. Mr Koer tells his own story:

"I live with Sheryl and Andy Duthie on Oufontein, a farm 150 km outside Graaff-Reinet. We have cattle, goats, chickens, quails, game, dogs and Arabian horses – but my best from this mixed and merry lot is the Merino sheep. They are (obviously) not as smart as me, but even I couldn't be all creamy fleece the one day and a brick red beanie a few months later. Awesome, right?

My people are mad about their Merinos, but at least I go inside the bakkie for farm drives. I love sitting on the steering wheel. I also cuddle up in the kitchen with the dogs next to the AGA (oven, fireplace, heater and kettle all wrapped up in one huge cast iron kitchen cooker).

Talking of kitchens . . . I eat scrambled eggs three times a day, sometimes with a sliver of roast chicken. But my very best is scorpions. When the kids (Mark, James and Peanut) are at home from school (like many kids on faraway wool producing farms, they stay in hostels in towns and cities) we scoot to the koppies to turn stones and scratch around for scorpions. They're not poisonous to me – otherwise I wouldn't be here chatting to you, would I?

But I have to run . . .

We're off on a hunt today. I love hunting



Question:
Do you know what "malusi" means?

Answer:
Shepherd, in Xhosa as well as Zulu!

with my people, but get super stressed when they simply ignore the eagles. I shout a warning and run for cover, but they don't seem to have the foggiest idea about how exposed they are and how easily those humungous talons can take them for a fatal flight . . . When I was little and our den was disturbed by a jackal everyone ran like crazy. But I couldn't keep up because of my dodgy leg. I got left behind. This is when the Oufontein people took me right inside their home – and their hearts – and named me Mr Koer. That's the sound we meerkats make when we talk to each other.

Cheers for now! Koer, koer!

Mr Koer



Can you imagine there was a time when wool exporting was a crime punishable by death?

- Do you know the wool industry in South Africa began after a misunderstanding?
- How on earth is it possible that clothes made from wool can keep you warm as well as cool?
- How many sheep are grazing out there on our farms – thousands, millions or billions?
- Does shearing hurt?

Hi there, my name is Mr Malusi and I have the a baa c of wool at the tips of my tidy claws. So, to find answers to these and lots more questions join me on a tour through the wonderful world of wool as illustrated in Wool in South Africa. I bet you will love the frolic through fabulous pics, clever cartoons and five separate colour-coded sections as much as I do!



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