

## 2.1

# Dairy calf and heifer health care

## A. Development phases from a calf to a cow

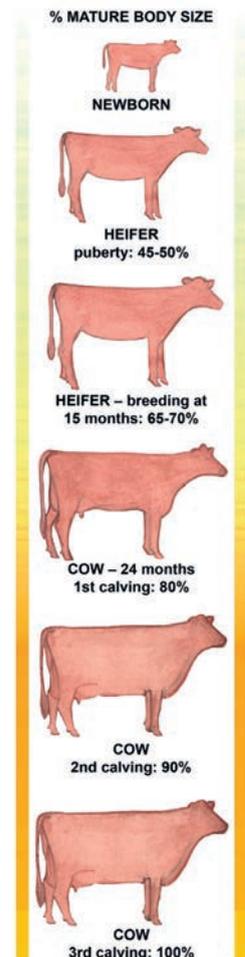
**Newborn calves are probably the most important animals on the dairy farm. They are the future of the herd. Well-raised and -managed calves grow into cows that have long and productive lives.**

Heifer calves should be ready for breeding by  $\pm 15$  months of age and are bred once they reach 65% to 70% of their expected mature mass. They continue to grow for nine more months until they deliver their first calf when they are  $\pm 24$  months old. During this growth phase they are referred to as heifers. Once the heifer has calved, it is referred to as a cow.

After the cow has had its first calf, it is re-bred after a two- to three-month period and another calf will be delivered nine months later. The goal is that the cow should calve once a year and deliver more than four calves during its lifetime.

Here are some targets to aim for in your calf management practices, to know if you are on the right growth track to raise a heifer.

- At puberty the calf should be around 45% to 50% of its expected mature body size.
- At breeding, it should be around 65% to 70% of mature body size.
- At first calving,  $\pm 80\%$ .
- At second calving,  $\pm 90\%$ .
- By the third calving, 100%.



## **B. The five Cs of calf care**

**Dairy calves are the future of the dairy herd. It is important to take very good care of them. To raise healthy calves that will one day give large amounts of milk, always remember the five Cs:**

### **1. Cleanliness**

Calves must be born in a clean and dry place. Keep the calf pen clean and avoid wet, moist soft bedding. Make sure there is enough fresh air, but no draughts. Bottles and pails used to feed calves, must be properly cleaned and sanitised. Scrubbing with a brush is usually the only way of cleaning properly. Use only clean buckets.

### **2. Colostrum**

Feed two to four litres of good quality colostrum to the calf within one to six hours of its birth. Feed the calf another two to four litres of colostrum at its second meal 12 hours later. Colostrum is full of antibodies and various nutrients that the calf needs to protect it against diseases.

### **3. Calories**

On days two and three, the calf must be fed milk from cows that have recently calved and of which the milk cannot be sold yet. Give two litres of milk in the morning and two litres in the evening.

On day four you can also start feeding the calf a small amount of good quality calf starter meal (pellets) twice a day. Calf starter is high in protein, high in energy and low in fibre.

### **4. Comfort**

If calves are comfortable, they can use their nutrients to grow big and strong. Make sure the bedding is dry. Calves must never stand in the wind or rain and must always have clean water and fresh feed. Throw leftover feed, milk and water away at the end of every day.

### **5. Consistency**

Calves must be fed at the same time every day and the milk must always be given at the same temperature. If you feed cold milk to calves that are used to warm milk, they will get sick. Always feed the same calf first. It is best if the same person works with the calves every day. That person will immediately see if one of the calves is getting sick. The calf can be treated before it is too late.



- **Colostrum:** The newborn calf must receive colostrum from the cow.
- **Calf housing:** Calves must be housed in a clean and dry place, with enough fresh air, but no draughts.
- **Comfort:** Provide dry bedding, clean water and fresh feed.



- **Constant care:** Feed calves at the same time every day. Milk must always be given at the same temperature.
- **Cleanliness:** Wash and sanitise feeding bottles and buckets regularly.

## C. Signs of a healthy calf

The person caring for the calves should spend enough time observing the calves and should inspect them at least twice a day. It is important to know what a healthy calf looks like so that you will be able to immediately identify a sick calf and take action.

Calves that are sick should be isolated from the healthy animals. This would reduce the risk of spreading disease and enable you to monitor and nurse them individually.

**Indicators of healthy or sick calves are the following:**

What to look at	Indicators of a healthy calf	Indicators of a sick calf
<b>Eyes</b>	Bright eyes.	Sunken or glazed eyes.
<b>Ears</b>	Upright ears.	Drooping ears.
<b>Nose</b>	Damp, with no nasal discharges.	Dry nose, which indicates high temperature. Nasal discharge, which indicates respiratory infection.
<b>Coughing</b>	No excessive coughing.	Regular coughing and fast breathing.
<b>Tail</b>	Clean, which indicates that the consistency of the faeces is normal.	Dirty tail because of diarrhoea.
<b>Hair</b>	Should be smooth and shiny.	The coat feels harsh and rough.
<b>Faeces</b>	Should be soft, but without being so dry that it causes discomfort when passed.	Loose and even watery faeces; very watery faeces usually indicates diarrhoea (scours).
<b>Appetite</b>	Healthy appetite; consumes feed with ease.	Loss of appetite, resulting in weight loss.
<b>Activity</b>	The calf is lively, stands and moves with ease and runs around.	Calf is listless and lying down; it is slow and has difficulty getting to its feet; it lies down quickly after the routine disturbance of feeding.
<b>Navel</b>	No swelling or redness.	Enlarged, swollen, redness, hot and even abscess formation.
<b>Skin fold test</b>	When pinched and released, skin returns to normal state immediately.	When pinched and released, skin remains folded like a tent.
<b>Suckling reflex</b>	Strong suckling reflex.	Decreased ability to suckle.



- It is important to know what a healthy calf looks like so that you will be able to immediately identify a sick calf and take action.

## D. Vaccination programmes of dairy calves and heifers

Sometimes farmers think they will save money by side-stepping vaccination. However, vaccination is actually the most effective and cheapest insurance that the farmer can take out for the sound health status of his animals. It would be wise to protect your animals through vaccination, because healthy animals produce more.

Vaccines are used to prevent diseases and will not help if your animal is already sick. Remember that it takes time for the animal's body to build up antibodies against a disease. You should follow the veterinary surgeon's advice and instructions regarding vaccination very carefully.

### Immunise and dose your calves

To improve the health of your calves, it is important to work closely with your veterinarian or extension officer to compile an immunisation programme for your farm.

Disease or parasite	When to treat	Frequency
Anaplasmosis	3–9 months	Once
Anthrax	3–6 months	Annually
Brucellosis	4–8 months	Once only to heifers
Paratyphoid (salmonellosis)	7–14 days, plus booster 3 weeks later	Once only if a problem
Blackquarter and botulism	6–9 months, plus booster 3 weeks later	Annually until age 3 years
Lumpy skin disease	7 months or older	Annually, September–November
Three-day stiff sickness	6 months or older	Annually, September–November
Redwater	3–9 months	Once
Heartwater	1–4 weeks old	Once
<b>Internal parasites</b>		
Roundworms	2, 4, 6, 9 and 12 months	Strategic dosing; thereafter annually in March from the second year
Flukes	Start in September, then again in mid-March	Twice annually
Tapeworms	1, 2 and 5 months	When needed

Calves must be dosed against internal parasites such as tapeworm and roundworm from a young age. Ask your veterinarian which vaccinations and deworming remedies are a MUST, which are good to immunise (recommended) and which only have to be immunised occasionally.

Before using a vaccine, it is important to read the labels carefully.

**A vaccine will only work if:**

- Correctly handled according to instructions.
- The right dosage is given.
- The animal is vaccinated at the right age.
- The animal is vaccinated when it is healthy.
- The booster vaccination is given if needed.

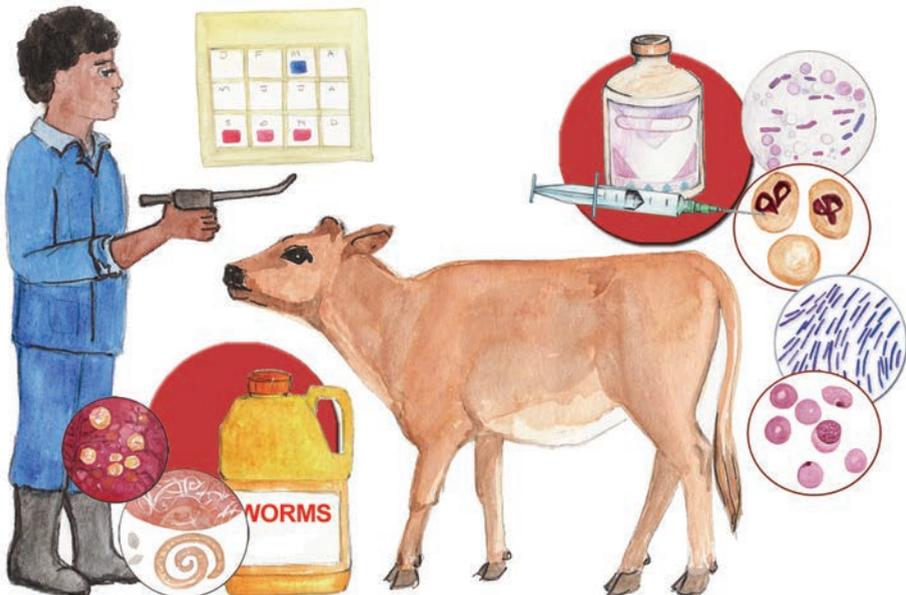


**A healthy calf grows better**

- Follow an immunisation programme.
- Ask your veterinarian which diseases are important in your area.
- Treat calves against internal parasites from a young age.

**Important!**

- Read the labels carefully and follow the instructions.
- Always give the right dosage, at the right age, when the animal is healthy.



## 2.2

# Calf-rearing systems

## A. Biosecurity of calf-rearing facilities

**Biosecurity is the term used to refer to the protection of livestock from contact with disease-causing organisms.**

One of the greatest disease risks to a calf is from other cattle, whether through direct contact or through indirect contact such as surfaces, equipment or people contaminated by diseased animals. This risk is greatest when cattle are brought together into housing and when stress factors are not taken care of, which causes the immune system of the calves to be suppressed.

It is very important to tend to the welfare and biosecurity of your future dairy herd. Calf-rearing facilities should therefore be well designed in order to provide the calves with the necessary protection as well as comfort.

**Proper calf housing that will contribute to healthy, fast-growing calves, need the following:**

- Good quality clean and dry bedding for animals.
- Efficient drainage.
- Good ventilation – enough air and light.
- Easy access for animals and operators.
- Adequate and well-placed calf-feeding system.
- Isolated from older cattle.

There are many ways to house young calves, but the best-known ones are hutches, pens, group housing or calves tied to a post. The type of calf housing on a dairy farm will depend on the size of the farm and herd.

### **Calf hutch**

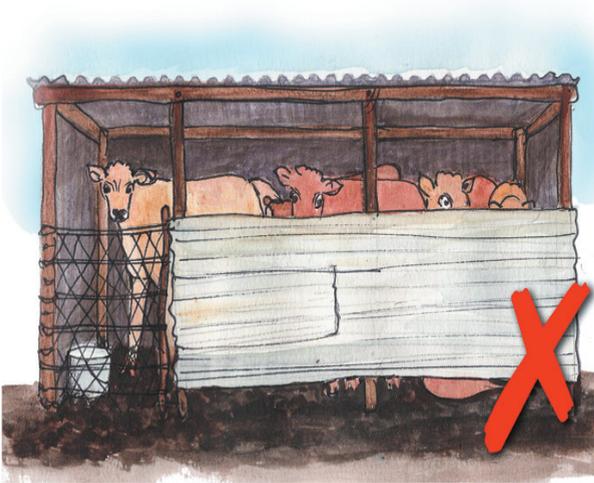
- Loose-standing, three sides, roof.
- Calf can walk in and out of front opening.
- Easily moved to another place.

### Calf pen

- Divided into smaller individual spaces for young calves to live and sleep in.
- Is covered with a proper roof.
- Good to keep calves from suckling each other and transmitting diseases.

### Group pens or houses

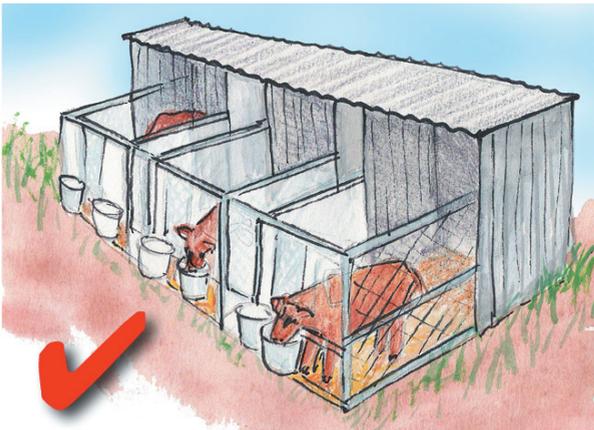
- Bigger space.
- Accommodate many calves older than eight weeks of age.
- Share feed and water.



- Young calves should not be housed together, as they may transmit diseases to one another.



- A calf hutch can easily be moved to another location.
- Housing must be well ventilated and dry.
- Do not store and mix feed in the calf housing.



- Calf pens have dividers and a roof and are good for housing more than one calf.

## B. Permanent housing and movable calf pens

**Calf facilities should be designed to minimise injuries and stress and to optimise health by providing suitable space, shelter from the sun, wind and rain, good ventilation, and ease of handling.**

### **Important principles regarding calf housing:**

- Good ventilation is important, but draughts should be prevented.
- Moderate temperatures should be maintained. Calves that are exposed to extreme temperatures grow more slowly and are more likely to get sick.
- Facilities must always be kept clean and dry, therefore should be easy to clean.
- Facilities should be sanitised regularly (sunlight is an excellent sanitiser).
- Units should be placed where there is minimum disturbance, i.e. far from heavy traffic or unruly dogs.
- Calf housing should not be used to store feed.
- Feed should not be mixed in the calf pen.
- The calf must have easy access to clean water and good feed.



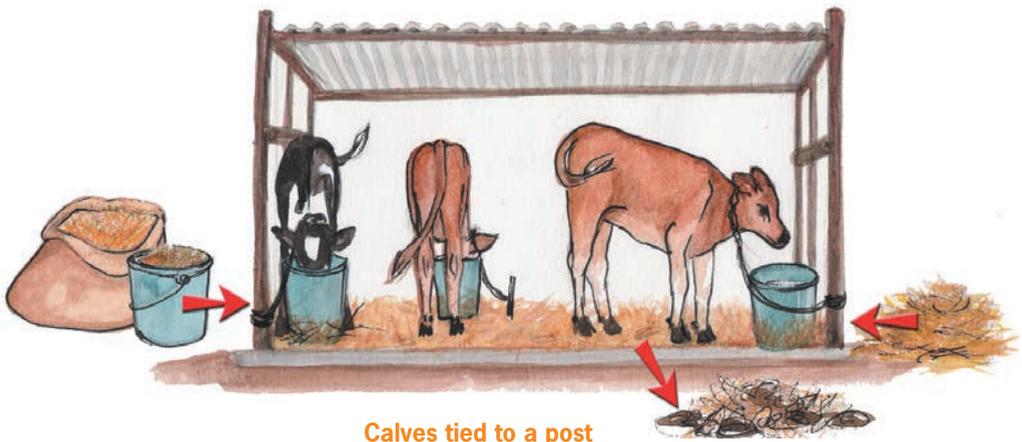


Keep feed separate!

Service area

### Young calves

- Keep calves apart to prevent them from suckling each other.
- Provide shade and clean, dry bedding.
- **Individual pens** must have solid walls to prevent draughts.
- **Group pens:** calves should be tied during and after feeding.
- Place dry feed in a clean bucket after feeding.



Calves tied to a post

## C. Deep litter systems

**Deep litter systems mean that you add dry bedding on top of existing old bedding on a daily basis to form layers. The reason why it is done, is to save time and labour.**

The animals benefit from this system because more heat is generated, thus it is also referred to as a compost system. Another benefit for animal welfare is that by providing a more comfortable lying surface, deep litter systems result in less joint cuts and scratches.

However, this system is a risk for disease, because you get a build-up of disease-causing organisms.

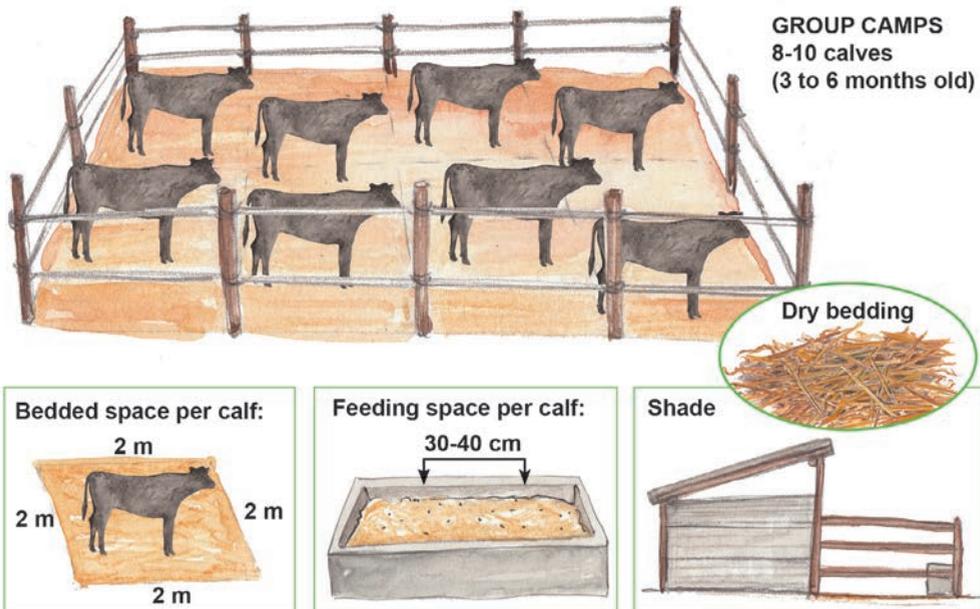


## D. Calf camps for group rearing after weaning

After weaning, calves can be housed in small groups according to age and size. Grouping can reduce the labour needed to feed and keep calves clean.

The following should be considered for group rearing of calves:

- Calves of the same size and age should be grouped together.
- Calves between the ages of three and six months can be divided into groups of 8 to 10 animals per pen.
- Each calf in the group should have 2 m x 2 m of bedded space and 30–40 cm of feeding space.
- Good quality water in clean water troughs.
- Calves should not be stressed by having too small a space or not enough feeding space. This can lead to problems such as calf scours and respiratory infections.
- It is important to provide shade at all times.
- The pens should be dried regularly.
- Sufficient dry bedding must be given to absorb liquid waste and to keep the calf's bed dry.
- Dirty bedding should be removed from the pens and fresh bedding added as often as necessary to maintain a clean, dry bed.
- Hard-surfaced floors are easier to clean with less labour than ground floors.



## 2.3

# Hygiene and care

## A. Importance of hygiene

**The main goal of every dairy farm is to produce high-quality, safe milk products. In order to reach that goal, we need to pay attention to hygiene from the calf-rearing phase.**

Baby calves are highly prone to disease and therefore it is critical to keep their environment as clean as possible.

**The following factors are important:**

- Avoiding calf-to-calf contact.
- Implementing fly control measures.
- Cleaning and disinfecting each calf pen/hutch between uses.
- Cleaning and disinfecting all equipment between uses with individual calves.
- Sanitising containers and utensils used for feeding milk, feed, or water (e.g. buckets, teats) between each feeding.
- Never using the same equipment for feed and manure handling.

Daily inspection practices will vary from farm to farm, but there are certain minimum standards that need to be followed if one wants to be effective in maintaining hygiene and proper care of the calves on a dairy farm. Attention to hygiene and a sanitation programme based on both safety and quality are essential.

**Hygiene:** the practice of cleanliness.

**Sanitise:** to clean something thoroughly by disinfecting or sterilising it.

**Disinfect:** to cleanse in such a way to destroy or prevent the growth of disease-carrying micro-organisms.

**Sterilise:** to destroy micro-organisms, usually by bringing to a high temperature, e.g. with steam or dry heat.



## B. Factors affecting hygiene and signs of poor hygiene

**A high standard of cleanliness should be maintained at all times in and around the housing areas.**

Various factors will have an influence on the hygiene of the environment in which the calves and heifers are taken care of.

**The following should get attention:**

- Housing hygiene, such as the condition of the barn floor (presence of potholes, drainage system, and accumulation of dung).
- General hygiene in the calf housing and its surroundings.
- Manure handling.
- Type of bedding and maintenance of calf and heifer beds.

**The following are signs of poor hygiene:**

- Dirty animals.
- Dirty, moist bedding in lying areas.
- Passageways with build-ups of dung, slurry and mud.
- Water troughs that are dirty.
- Too many flies.
- Bad odours.



## C. Fly control

**Flies can cause tremendous financial losses. Animal production can decrease. Milk production easily drops by one to two litres per cow per day because of flies. Flies can also spread dangerous animal and human diseases such as mastitis, tuberculosis and pinkeye.**

### **The life cycle of the fly**

Flies breed in areas where there is enough food for the developing fly larvae to feed on. This includes dung, uncovered drains, drainage areas and decomposing old feed waste. The female fly lays up to 900 eggs in its lifetime of three weeks. These eggs will develop into larvae and fly pupae within seven days. After two or three days, adult flies will start hatching.

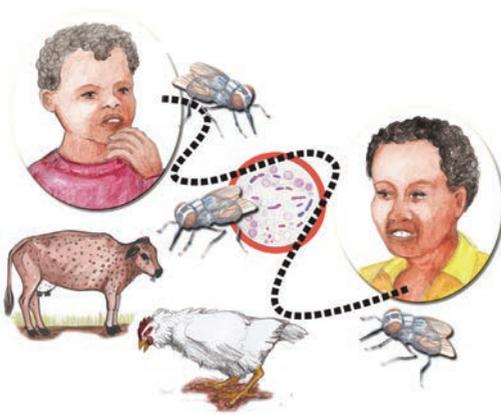
### **Fly control**

**There are several ways to control flies, such as:**

- Mechanical methods (fly-catching methods).
- Chemical control (insecticides and larvicides).
- Biological control (parasitic wasps that prevent flies from hatching from fly pupae).

**Effective long-term fly control should include various control measures such as:**

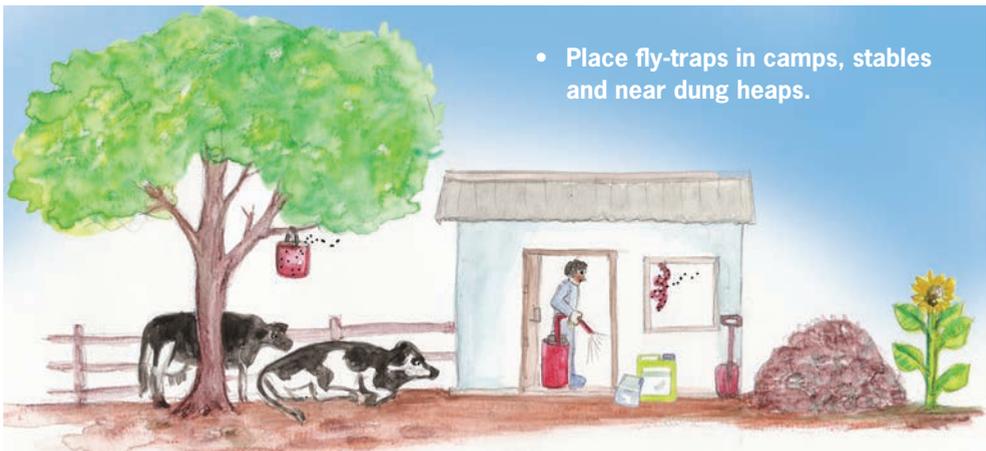
- **Reducing fly breeding sites:** Special attention should be given to manure management, reducing feed spillage, reducing effluent from silage pits and the prevention of water leaks.
- **Wise use of chemicals or adult fly-catching techniques:** This will prevent the flies from becoming resistant to chemicals. Rotate chemical groups and target the adult fly resting places such as under roofs, against feed bunks, fences and vegetation. Killing adult flies is not an effective way of fly control.
- **Applying larvicides to fly breeding sites:** Cyromazine is the best larvacide to use, as it does not affect good insects such as parasitic wasps. However, be careful not to contaminate feed or water.
- **Introduce biological fly control:** Keep fly areas dry. This will decrease fly breeding and increase parasitic wasp breeding. Parasitic wasps are now bred for release on fly breeding areas on farms. The wasps are tiny and harmless to everything else but fly pupae.



- Flies can contribute to the spread of diseases such as: cholera, tuberculosis, polio, typhus fever and Newcastle disease.
- Apply insecticides to places where flies sit and breed (dung heaps, drains and manure dams).



- Use chemicals wisely and do not contaminate feed or water.
- Practise good manure management.
- Keep camps and stables clean and dry.



- Place fly-traps in camps, stables and near dung heaps.

## D. Personal hygiene and protective clothing

All the people on a dairy farm should be informed about the reasons behind the importance of constant personal hygiene and the use of protective clothing.

A high standard of personal hygiene is as important as any other measure in preventing and controlling the spread of diseases.

- No spitting, smoking or sniffing in the workroom.
- Employees should inform the employer when they become ill (especially diarrhoea or vomiting, sore throats, infected cuts or any other septic conditions).



- Enough clean working clothes to allow regular changes.
- Clean head-covers.
- Suitable footwear.
- Sufficient warm water, soap, nail brushes and clean towels for regular washing of hands.
- Fingernails should be short and clean.





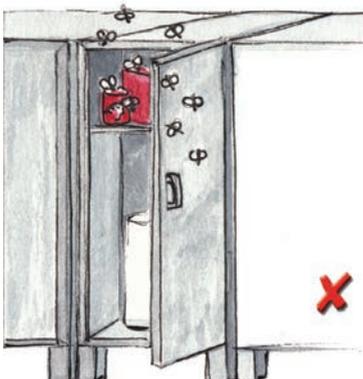
**Prevent contamination**

- ✓ Wash your hands after eating, sneezing, coughing, smoking and visiting the toilet.
- ✓ Wear clean protective clothes to every shift.
- ✓ Keep your work area clean.



**DO NOT:**

- ✗ Work with food or packaging materials while you are sick.
- ✗ Wear jewellery and nail polish while working with processed food.
- ✗ Leave opened food in your locker.
- ✗ Eat, drink or smoke while working with the processed food.
- ✗ Play in the processing area.



## 2.4

# Calf feeding

## A. Handling and feeding of colostrum

**The first milk a cow produces after calving is called the colostrum. It has a yellowish colour and looks like cream in thickness. Colostrum has antibodies from the cow that protect the newborn calf from disease and infection. This “first milk” has high levels of protein, fat, lactose, minerals and vitamins. The nutritional value of the colostrum is approximately 40% more than that of ordinary milk.**

Newborn calves are not born with the ability to fight diseases and are highly stressed. Therefore they need colostrum to build up their immunity.

The newborn calf requires at least two to four litres of this milk within one to six hours after birth and it should be followed up with another two to four litres within the next 12 hours. After the first day, continue with colostrum feeding for the following three to four days.

Suckling is a reflex in the newborn. It is absolutely essential to encourage suckling while the animal is very young. Do this by getting the animal to suck your fingers. Have the bottle of warmed milk ready and at hand. Spend some time with the calf, give its body a rub-down and make it feel comfortable. With one hand, rub around the hairless area of its anus to mimic what its mother would do as she washes its “bottom”. Hold the bottle so that the teat is just touching near its mouth. Hopefully the newborn’s rooting reflex will kick in and its mouth will search for the teat. Once the teat is in its mouth, it will start to suckle. Calves often copy their pen mates (if you are feeding calves in a group).

Storing high-quality colostrum is good management practice.



- The best way for a calf to get colostrum is by drinking from its mother, but if the calf is too weak to nurse, milk out the colostrum and feed the calf the two to four litres of colostrum with a bottle and a teat.



**There are two reasons for storing colostrum:**

- Colostrum is frozen for the purpose of providing antibodies in emergency cases. Thawing should be done at room temperature – do not use boiled water to quickly thaw the frozen colostrum, as it will destroy the nutritional value.
- Any colostrum can be stored for nutritional purposes.

Surplus colostrum can then be used when good quality, fresh colostrum is not available for a newborn calf. Colostrum must be fed as soon as possible (within one hour) after collection, or cooled to less than 4 °C to prevent bacterial growth during storage. Do not expose colostrum to room temperature, as even half an hour at room temperature during the summer may cause bacterial populations to double.

**Colostrum can and should be preserved as follows:**

- Refrigerate – should be used within one week.
- Freeze – up to six months. Freezing is the best method of preservation because not much of the nutrients and tastiness is lost in the process.
- Ferment – as soon as the colostrum is sour, it must be kept in the cold storage room at 4 °C. Add 1% propionic acid or 0,07% acetic acid. Stir the mixture and keep in a cool place (21 °C or less) in plastic containers for several weeks.

**How to teach a calf to drink from a bucket**

You also need to teach a calf to drink from a bucket. Remember that the longer calves are left suckling their dams, the more difficult it is to teach them this.

Usually the calf will drink from the bucket at head level after the third or fourth feeding. To avoid discomfort or even bloating, never let the calf drink from a bucket at floor level.

- Never let a calf drink from a bucket at floor level.



**Follow the following guidelines:**

- Hold the calf between your legs.
- Dip one finger into the bucket of milk and then insert your finger into the calf's mouth.
- Gently guide the head down so that the calf's mouth is immersed in the milk.
- Don't force the head down – a calf naturally sucks with its head slightly raised. In the beginning, raise the bucket with your free hand.
- As the calf sucks and swallows the milk, slowly withdraw your finger so that the calf begins to drink rather than suck.



## **B. Nutritional requirements at various ages**

**Nutrition plays a very important role in animal well-being, growth and immune system development. Dairy calves and heifers should receive proper care and high-quality feeding, because they are the future of your dairy herd.**

**Feeding of calves normally takes place in four phases:**

- 1.** Colostrum phase (three to four days).
- 2.** Milk-feeding phase (milk and dry feeds until weaning).
- 3.** Weaning.
- 4.** Post-weaning stage (dry feeds).

The most important factor in dairy calf health and survival is feeding the newborn calf enough high-quality colostrum early in its life. Colostrum is also important as the first source of nutrients after birth.

On days two and three, the calf must be fed transition milk from cows that have recently calved and of which the milk cannot be sold yet. Give two to four litres of milk in the morning and in the evening, depending on the age and size. The general guideline is to feed calves 8% to 10% of their body weight divided into two feedings per day.

The temperature of the milk should be the same as the normal body temperature of dairy cattle (39 °C). Never take milk from the cooler tank to feed your calves, since the cold milk will cause diarrhoea.

Whole milk is an excellent feed, but is costly when the milk price is good. Milk replacers are widely used by dairy farmers as a substitute for whole saleable milk.

You can teach a calf to eat the calf starter (pellets or meal containing at least 18% good quality crude protein) by rubbing some into its muzzle after it has finished drinking its milk. A small amount is then thrown into the empty milk bucket. Never mix the starter meal with milk.

Once the calf has grown used to the taste, it should have free access to the meal. Fresh calf starter should be controlled and given daily according to the age of the calf, in order to prevent wastage and health risks. There is a link between the amount of dry feed eaten within five weeks of age and the live weight gain over the same period: The more the calf eats, the more weight it gains. This rate of growth will never be achieved again in the animal's lifetime.

In general, calves should be weaned at 8 to 12 weeks of age. By this age they require less protein and they are used to eat other foods. On some dairy farms calves are weaned earlier to save milk feeding costs.

When you remove the heifers from the individual calf hutches following weaning, group them according to age in small, even groups where they have sufficient access to forage and concentrates, as well as fresh, clean water.

**The feeding programme should be adjusted according to the following age groups:**

- Weaning to 6 months.
- 6 to 12 months.
- 12 months until breeding.
- Pregnant heifers until calving.

Overfeeding heifers to the point that they get fat can cause breeding problems and calving difficulties.

Underfeeding heifers causes decreased growth rates and can delay or suppress oestrus. Breeding is thus delayed until heifers reach target weight and height.

Calves and heifers should also have enough good quality water to drink. Regular cleaning of water troughs or buckets is important, because dirt in the water makes a good breeding ground for bacteria. Separate the water and feed troughs to allow shy feeders a chance to feed, while dominant feeders are at the water trough.



## C. Weaning a calf

**When you decide to wean your calf, it is important that you plan the weaning. The following aspects must be included in your planning:**

### Water

Calves must have fresh, clean water to drink from the day that they are born. For the first three weeks after birth, calves drink between one and 1,5 litres of water a day. Remove the water when you feed the milk and replace the water one to two hours after feeding. Make sure that their water is always clean and fresh by replacing it twice a day. Remember, on hot days the calves will need to drink more water and on cold days they will drink less.

### Milk feeding

A very common practise is to decrease the milk volume gradually  $\pm$  two weeks prior to weaning. The reason for this is to decrease the stress levels of a calf at weaning.

### Calf starter

Prior to weaning, the intake of the calf starter should be at least 800 g to 1 kg per day. After weaning you change to a growth concentrate, containing at least 16% crude protein.

### Prepare for weaning

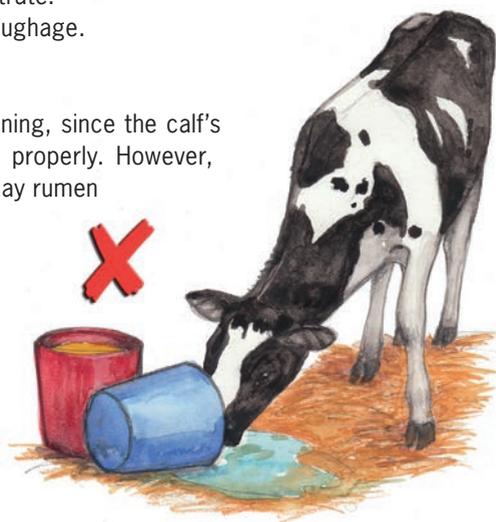
Give vitamins A, D and E supplements two weeks before weaning. Calves are usually ready to wean when they are between 60 and 90 days old.

### Weaning programme

- Decrease the milk volume gradually  $\pm$  two weeks prior to weaning.
- At the point of weaning, stop milk completely.
- Change from calf starter to growth concentrate.
- Allow calves free access to good quality roughage.

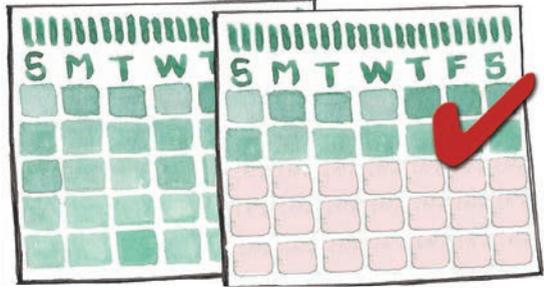
### Hay

Good quality hay must be available after weaning, since the calf's digestive system should now be functioning properly. However, when hay is given before weaning, it could delay rumen development.





- **Clean fresh water** should always be available.
- **Calf starter meal** can be fed four days after birth until weaning.
- **Wean calves** from age 6 to 12 weeks. Stop milk feeding gradually.
- **Prevent stress:** Do not move calves to new pens, castrate or dehorn them while being weaned.



Wean between 60 and 90 days



## 2.5

# Dairy calf diseases

## A. Diarrhoea

Newborn calves very easily get calf scours or diarrhoea. They usually get sick during their first 28 days of life. Bacteria and viruses attack the lining of the calf's intestines, making it difficult for the calf to absorb nutrients from milk. This causes watery diarrhoea and the calf loses fluid, electrolytes and nutrients and becomes dehydrated. Calves can even die.

### What causes diarrhoea?

- Colostrum that is not of good quality.
- Not enough colostrum.
- Difficult calving.
- Dirty housing.
- Cold, wet weather.
- Sometimes the use of poor quality milk replacers can cause diarrhoea.
- Viruses and bacteria.

### Symptoms of scours

- Diarrhoea that sometimes contains blood or mucous. The calf's tail will be dirty.
- Dehydration: The calf's skin looks dry and eyes are sunken.
- The calf's hair is rough, instead of smooth and shiny.
- The calf loses weight.
- Weak to no suckling.
- The calf moves slowly and lies down quickly after getting up.
- The calf can die within 12 to 48 hours after the illness has started.

### How to treat scours

- Calves with diarrhoea must be rehydrated (given fluids with electrolytes and nutrients) as soon as possible.
- They must have clean water to drink.
- If the diarrhoea is caused by bacteria, the calf must be treated with antibiotics.
- Continue with milk feeding to supply essential nutrients.

Ask your veterinarian or extension officer to help you diagnose the cause of the diarrhoea and to prescribe the best treatment.

**An electrolyte solution should be administered to fight dehydration.**

**If a commercial product is not available, the following solution can be given three times daily:**

- 1 teaspoon salt.
- 1 teaspoon bicarbonate of soda.
- 1 teaspoon potassium chloride.
- 2 tablespoons glucose.
- 1 litre water.



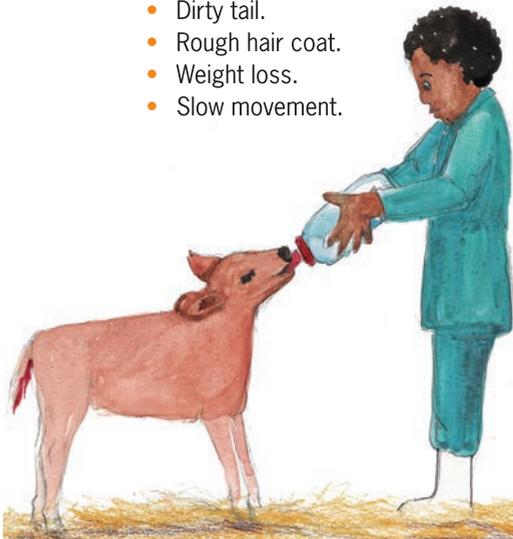
### Causes

- Not enough colostrum.
- Difficult calving.
- Dirty housing.
- Cold, wet weather.
- Milk formula.
- Viruses and bacteria.



### Symptoms

- Loose skin.
- Dirty tail.
- Rough hair coat.
- Weight loss.
- Slow movement.



### Treatment

- Give clean water with electrolytes and nutrients.
- Treat with antibiotics.
- Continue with milk feeding to supply essential nutrients.



## B. Salmonellosis

**Calf paratyphoid is a common disease of young calves under the age of three months, although adult cattle can also become infected. It is more common among the calves of dairy cattle, because they are often taken away from their mothers very soon after birth and are then exposed to stress factors such as a new environment, inadequate colostrum intake and even starvation.**

### **How does the disease spread?**

The disease is caused by two bacteria known as *Salmonella dublin* and *Salmonella typhimurium*. Sick animals and carrier animals can contaminate water and feed. The animals set millions of bacteria free in their manure. The bacteria can also be set free in urine, saliva and milk.

The chicken litter that is often fed to animals, is a major source of *Salmonella* bacteria. Most animals become infected when they ingest bacteria while feeding. Humans can become infected if they eat contaminated animal products such as meat, milk and eggs.

### **Symptoms**

The acute variety affects calves and older cattle. Symptoms are loss of appetite, a fever, foul-smelling diarrhoea that looks like putty and is watery at first, after which it becomes slimy and bloody.

The chronic form of the disease affects animals older than three months. The symptoms are poor growth, watery manure or light diarrhoea, general deterioration, chronic pneumonia and continuous coughing.

Calves with the septic form usually die before the first symptoms show. Animals that do survive the acute and chronic varieties of the disease, often develop arthritis and pneumonia or meningitis.

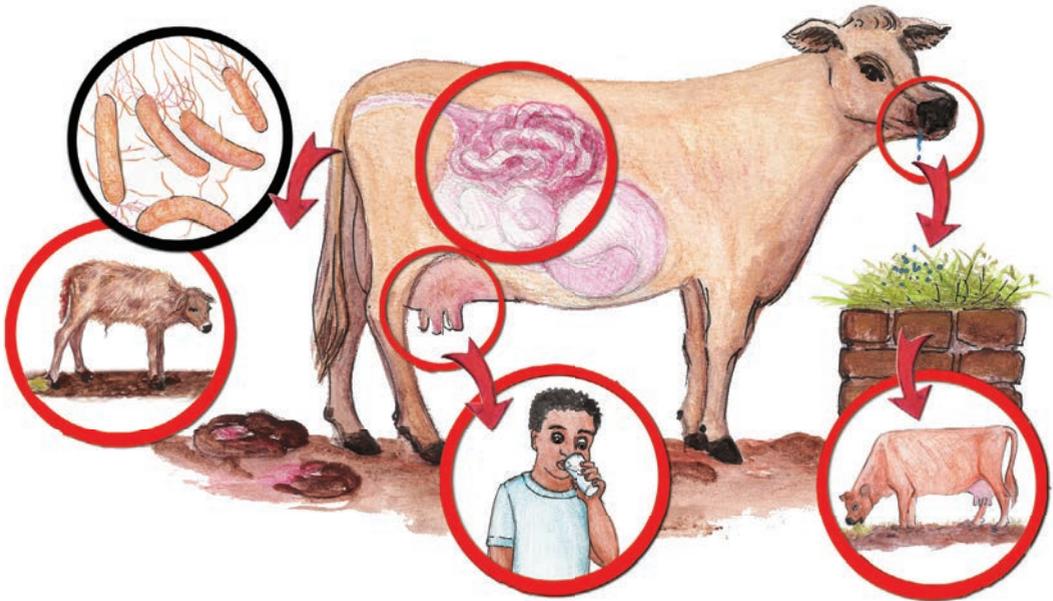
### **Treatment, prevention and control**

It is very important that you contact your veterinarian if you suspect salmonellosis among your livestock. The veterinarian will make a diagnosis and will treat the sick animals with antibiotics. The sick animal must be isolated from the rest of the herd.

Additional treatment may include hydrating the calf with electrolytes, anti-inflammatory substances, and establishing good farming methods and biosecurity measures. A good vaccination programme is very important and calves should be immunised between the ages of two and four weeks, followed by a booster. Pregnant cows may be vaccinated four to six weeks and again two to three weeks before calving with the inactivated vaccine.

**Causes**

- Sick animals contaminate water and feed with their dung, urine, saliva and milk.
- Chicken litter.
- Meat, milk and eggs infect humans.



**Treatment**

- Treat with antibiotics.
- Keep sick animals apart from the herd.
- Feed calves electrolytes.

**Prevention**

- Follow a vaccination programme.
- Feed calves sufficient colostrum.



## C. Colibacillosis (white scours)

Another bacterium that is a common cause of diarrhoea in calves is *Escherichia coli* (*E. coli*). The course of the disease is quick: from weakness, diarrhoea, dehydration, to death can be less than 24 hours. Antibiotics rarely affect the outcome of this disease; fluid support is critical to survival.

Fever is not a regular finding in calves with septicaemia (bacteria and its toxins); many have normal or subnormal temperatures.

**Early signs of septicaemia may not be easily detected, but affected calves will have symptoms that can include the following:**

- Depressed and weak.
- Reluctant to stand.
- Suckle poorly within five days of birth.
- Swollen joints.
- Diarrhoea.
- Pneumonia.
- Meningitis.
- Cloudy eyes.
- A large, tender navel may develop.

Most calves with septicaemia have a history of insufficient colostrum intake and are affected within the first three days of life. Vaccination of dry cows and good colostrum feeding can help to combat this problem.



## D. Other diseases

### Upper respiratory tract infections and pneumonia

Pneumonia is an inflammation of the lungs. Any one or a combination of the environmental and management factors, such as poor hygiene, poor housing/ventilation or insufficient colostrum intake, can make calves more susceptible to this disease.

#### Be alert for clinical signs of pneumonia that include the following:

- Nasal discharge (watery to purulent).
- Coughing (dry or wet).
- Fever of higher than 41 °C.
- Respiratory distress.
- Decreased appetite.

If calves are not treated with antibiotics at the very first signs of pneumonia, and for an adequate period, the surviving harmful bacteria may start growing again and the calf may have setbacks with continuing attacks of pneumonia.

### Calf diphtheria

Usually only a few calves in a batch are infected, though outbreaks can occur where hygiene is poor. There are two forms of calf diphtheria, both caused by bacteria.

The most common form is a serious oral (mouth) infection, usually seen in calves less than three months old. The first sign may just be a swollen cheek.

The second form is usually seen in older calves and affects the larynx (or voice box). Coughing will be moist and painful and it will be difficult to breathe, chew or swallow.

Speedy treatment is important because it is much more effective.

- Separate the infected animals and isolate them.
- Antibiotics and painkillers are effective in most cases.
- The laryngeal form is much more difficult to treat. Get veterinary advice.



### **Eye infections**

Pinkeye is a painful, weakening condition that can severely affect animal productivity. Pinkeye is a bacterial infection of the eye that causes inflammation and, in severe cases, temporary or permanent blindness. When both eyes are affected, cattle may die from starvation, thirst and accidents. The most effective form of prevention for pinkeye is to reduce the local fly population.

The first sign of pinkeye is an animal with a “runny eye”. In the first two days, the membranes of the eye are red and swollen (hence the name “pinkeye”) with a watery discharge causing tear staining and a closed eye. Whitish lesions that develop on the cornea and sensitivity to sunlight are also symptoms of eye infections.

One or both eyes may be infected. Eye infections are usually treated with antibiotic eye ointment, an eye patch or antibiotic injections (done by a veterinarian). It is also important to get the calf out of the sun due to light sensitivity.

### **Navel infection**

Navel infection, generally known as navel ill, is a bacterial infection of the navel of the newborn calf. As bacteria are everywhere in the environment, it will easily thrive in the calf’s warm and damp navel. It can then travel up the navel speedily and get into the calf’s blood. This can cause many serious health problems.

Calves with signs of an infected navel usually have an enlarged, painful navel that is wet and smelly, or has a puss-like or blood-tinged discharge.

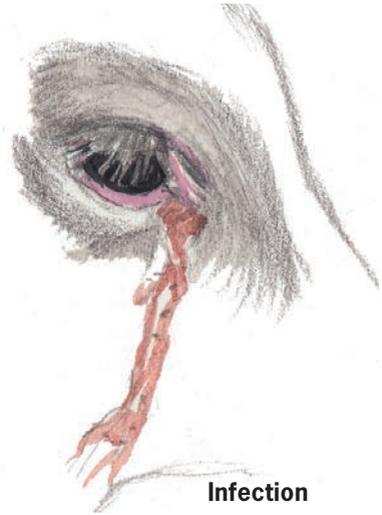
These calves may or may not have a fever but should be treated with an antibiotic to prevent the spread of the infection into the bloodstream. Calves with signs of navel infection should be treated promptly, as this is a sign that they may have bacteria circulating in their blood (septicaemia). Contact your veterinarian – usually the treatment will involve a course of antibiotics.

Animals diagnosed with navel infections should be housed separately and given antibiotics, fluid therapy and quality nursing care.

To avoid problems with navels among newborn calves, it is critical that calves are born in clean, dry pens. Hygiene plays a huge role in the prevention of navel infection. It is also important to apply disinfectant such as tincture of iodine to the umbilical cord after birth.



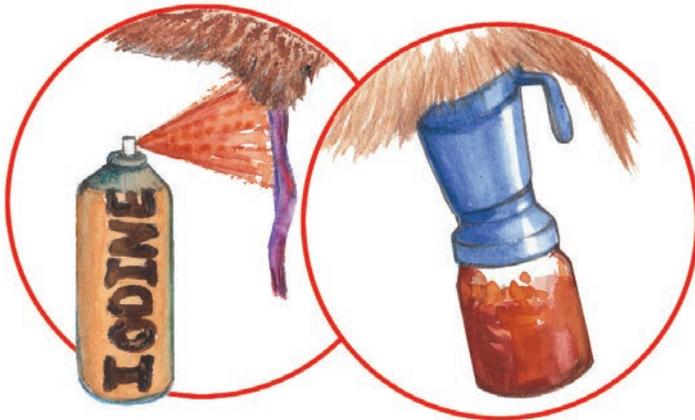
**Pinkeye**



**Infection**



**Swollen navel**



**Iodine navel spray or dip**

## 2.6

# Calf and heifer care

## A. Calf and heifer handling and restraining

**The general rule regarding calf and heifer handling is that humane handling reduces stress on animals, while upholding the safety of the people working with them. Handle all cattle as gently as possible and work at keeping them calm at all times. Reduce noise levels – no yelling or screaming when moving cattle.**

Handling aids should only be used when necessary, and then only by trained employees. NEVER strike an animal. Pay extra attention to animals that are sick and/or immobile.

Skilled, motivated and caring staff can contribute much to lessen stressful situations when calves need to be restrained or handled. Handling calves will be much easier if you understand their behaviour as cattle.

Cattle have panoramic vision – they can see all around without turning their heads. This affects how they respond to their environment and how you must act around them.

Cattle seldom use the front feet as weapons, although they may paw the ground to show anger. However, they can cause fractures or severe bruising when stepping on feet, and even small calves can inflict pain.

Proper application and the right choice of restraining equipment and facilities are very important factors for reducing potential injuries to the animal as well as the animal handler. A treatment stall (hospital pen) should be considered an essential part of a dairy farm.

**Before selecting the animal restraining equipment and/or the facility, ask yourself the following:**

- Will it be safe for the animal handler?
- Will it be safe for the animal?
- Will it help to get the necessary treatment done?



## B. Identification, marking and branding

All owners of livestock have the chance to get a registered identification mark. The identification mark shows to whom the animal belongs. A legal identification mark is very useful. If lost or stolen animals are found, it is possible to find the owner.

### How to register an identification mark

- Get an application form from extension officers, magistrates' offices, stock-theft units of the South African Police Services or from the Registrar of Livestock Identification in Pretoria.
- There is an application fee to be paid, but you only have to pay once.

### Rules for registering an identification mark

- All identification marks must be registered. This means that your mark is put on an official list and no one else may use it.
- You may not put an identification mark on your animals if you have not registered the mark.
- You may use the same mark for your small and large stock.
- If you buy animals or receive them as a gift, you must put an identification mark on them within two weeks.
- The animals that you sell should also carry your identification mark.

### Ways to identify your animals

**Permanent identification marks can be put on animals in three ways:**

- **Hot iron branding:** The stock owner burns a mark on the skin of his animals with a hot iron. You should not brand calves younger than six months old in this way.
- **Freeze branding:** A brand mark can also be put on the animals by means of freeze branding, which is done with dry ice and alcohol.
- **Tattoo mark:** Tattoo tongs and ink are also used to mark the animals. Calves can be tattooed from the age of one week.

### What does an identification mark look like?

An identification mark consists of no more than three letters of the alphabet or symbols (characters). The same mark may be used on large or small stock.

### Where to put the identification mark

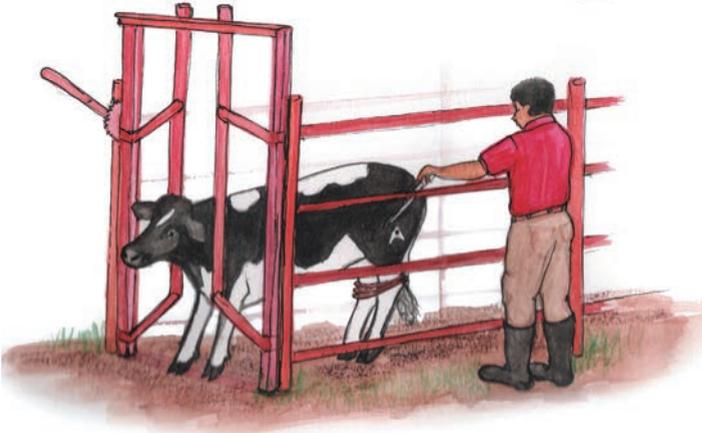
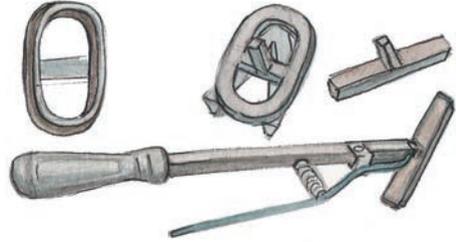
- Put the identification mark as low as possible on the body, but where it can be seen easily.
- Do not put the mark on the feet.
- Remember, you can lose money on hides if you mark in the valuable areas.

If you want to know more about the identification of animals, you can ask at your extension office, veterinarian or stock-theft unit of the South African Police Services. You can also phone the Registrar of Livestock Identification in Pretoria at 012 319 7449/012 319 7433, or you can write to The Registrar of Livestock Identification, Private Bag X138, Pretoria 0001.



- Register your identification mark.
- Your mark will be put on an official list and no one else may use it.

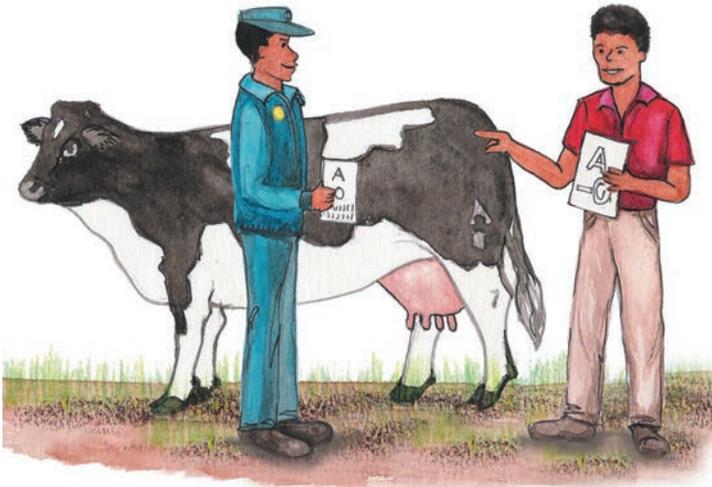
- Buy branding tools.
- Use the same mark for your small and large stock.



#### Methods

- Hot-iron branding.
- Freeze branding.
- Tattooing.

- When livestock is lost or stolen, an identification mark helps the police to identify who the owner is.



**Marking with a hot iron**

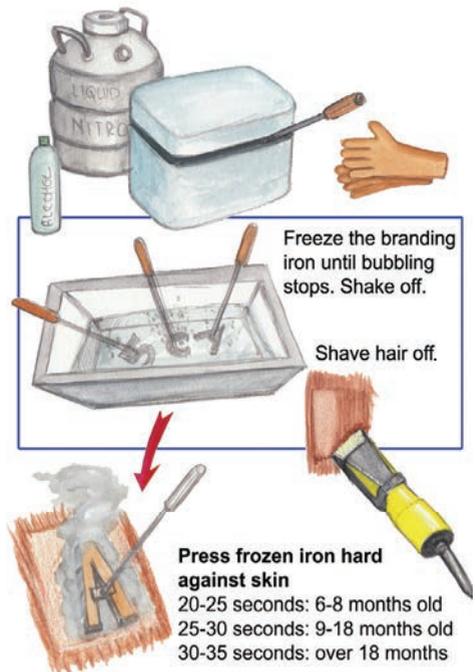
- Step 1:** Use a separate iron for each character of the mark. It is easier.
- Step 2:** Get everything ready before you start marking.
- Step 3:** Get someone to help you. The helper must bring the animal closer and hold it firmly. If you have a crush-pen, branding will be easier.
- Step 4:** Heat the iron well. When the iron becomes whitish, it is hot enough. You may test the iron on a piece of wood to see if it is hot enough.
- Step 5:** Knee-halter the animals so that they do not kick you.
- Step 6:** Take the first iron and put it against the animal's skin for three counts. Do not press. Count 1, 2, 3 slowly. Take off the iron. Take the second iron and do the same. Do the same with the third. Now the mark is complete.
- Step 7:** Spray some cold water onto the brand so that the animal's skin can cool down. You can also spray wound oil on the mark. Do not wipe it with a cloth and never rub manure on the mark.



**Marking with a freeze-branding iron**

**Equipment needed:**

- Coolant, dry ice in ethyl, methyl or isopropyl alcohol and liquid nitrogen.
- An isolated container for the coolant.
- Set of copper or high-quality bronze alloy-branding irons.
- Set of clippers.
- 95% ethyl or methyl alcohol.
- Gloves.



**Step 1:** Get everything ready before you start branding.

**Step 2:** Get someone to help you. The helper must bring the animal closer and hold it firmly. If you have a crush-pen, branding will be easier.

**Step 3:** Knee-halter the animals so that they do not kick you.

**Step 4:** Shave off the hair on the spot to be branded.

**Step 5:** Freeze the irons by putting them in liquid nitrogen or in spirits that have been chilled to  $-40^{\circ}\text{C}$  by means of dry ice.

**Step 6:** When the irons stop giving off bubbles, they are cold enough to brand letters onto the skin. Shake off the nitrogen or spirits, otherwise the flow-off will also leave a mark on the skin.

**Step 7:** Press hard for the following exposure times:

- Animals of 6 to 8 months – 20 to 25 seconds.
- Animals of 9 to 18 months – 25 to 30 seconds.
- Animals over 18 months – 30 to 35 seconds.

### Marking by means of tattooing

A third method of identification is the tattooing of animals using tattoo tongs and ink:

**Step 1:** Get everything ready before you start tattooing.

**Step 2:** Get someone to help you. The helper must put the animal down and hold it firmly.

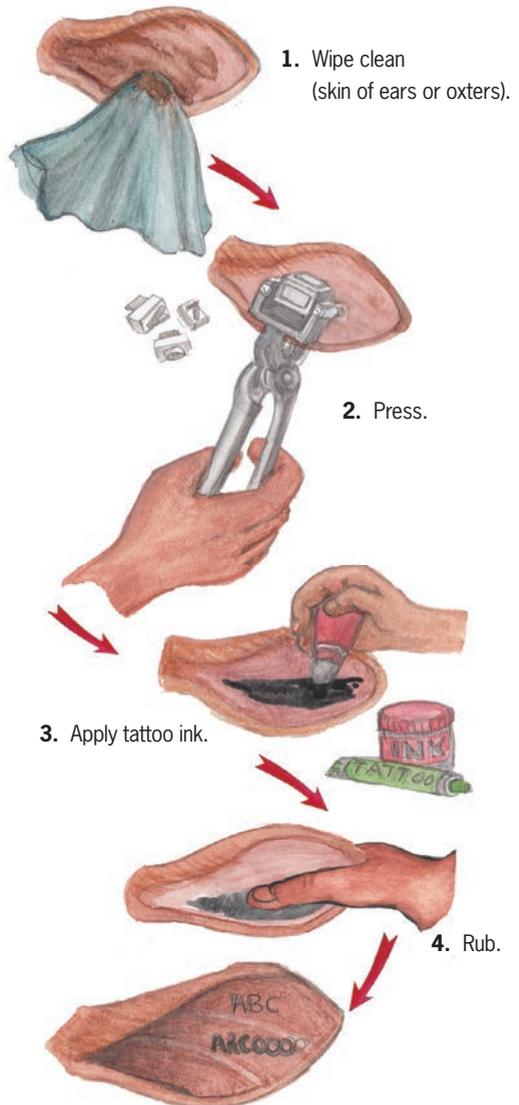
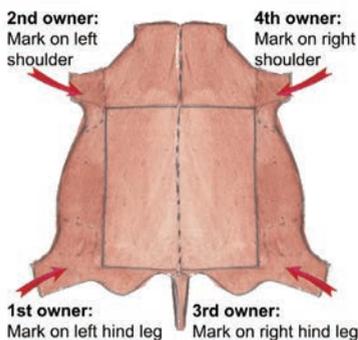
**Step 3:** Put the characters in the right order and position in the tattoo tongs.

**Step 4:** Apply the tattoo ink on the area to be branded (ears).

**Step 5:** Press the tongs until little holes on the skin appear.

**Step 6:** Rub the ink into the holes.

The tattooing process is complete.



### Where to put the identification mark

Put the identification mark as low as possible on the body, but where it can be seen easily. Do not put the mark on the feet. You can put the mark on the left hind leg, left shoulder, right hind leg or right shoulder.

Remember, you can lose money on hides if you mark in the valuable areas.

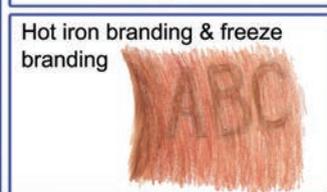
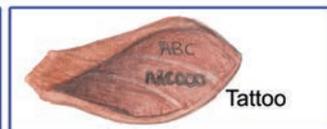
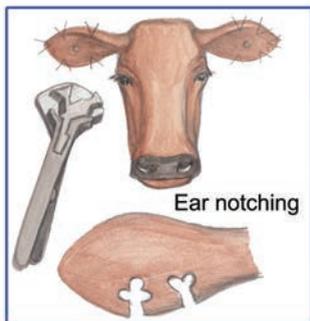
### Hot branding, freeze branding and ear tattooing

Knee-halter and crush-pen. Gloves.

**Hot iron:** Heat the iron (becomes whitish). Hold iron against skin for three counts (don't press!). Spray cold water onto the brand to cool down skin.

**Freeze-branding iron:** Branding irons, set of clippers, coolant. Shave off hair. Freeze the irons. Shake off the nitrogen or spirits when bubbling stops. Press hard.

**Tattooing:** Tattoo tongs and ink. Put characters in the tattoo tongs. Apply ink on ears or oxters. Press the tongs to make little holes in the skin. Rub ink into the holes.

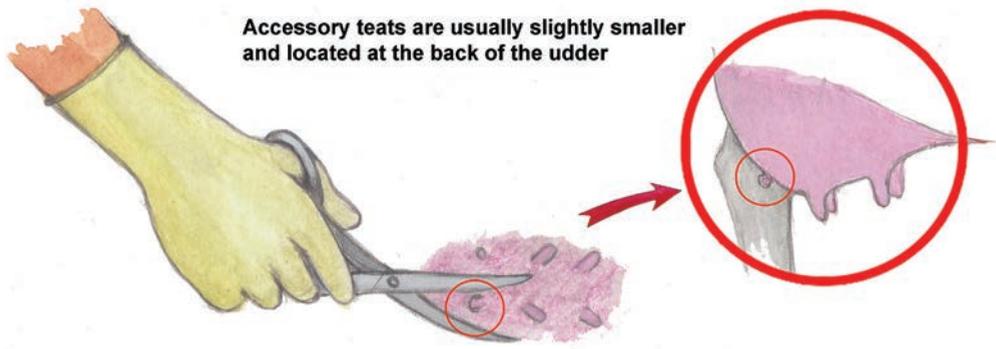


## C. Removal of accessory teats

Occasionally a calf is born with more than four teats, in which case the farmer should identify the four most desirable teats and remove the rest. Most accessory teats have a slightly different structure compared to regular teats. They are usually smaller and located at the back of the udder.

Removing an extra teat reduces one possible site of infection, since any unused opening is ideal for bacterial growth. Also, if extra teats get large enough they can interfere with the milking machines, so removal is usually necessary.

The extra teats are cut off with a sharp pair of scissors that has been disinfected. The wound is then disinfected with an appropriate disinfectant, such as tincture of iodine. It is advisable to apply a fly repellent close to the wound. This little operation should be done as soon as possible, but definitely within one month after birth. By properly removing an extra teat, pain is minimal and healing is fast.



## D. Dehorn your dairy calves

**Young dairy calves are usually dehorned to reduce the damage that the horns can cause to udders, flanks and eyes. You also need less trough space if your animals are dehorned. It is safer to transport cattle that have been dehorned. Dehorning can be done when a calf is younger than three months. The horn buds (developing horns) can be removed surgically by a veterinarian, or it can be done using a caustic paste or a hot iron.**

### **The caustic stick**

This method is suitable if you have few cattle. Put caustic soda (stick or paste) onto the horn bud before the calf is ten days old. Do not let the animal walk in the rain, because the caustic soda can run down from the horns and cause damage to the face. It can also run into the calf's mouth, causing great damage to the mother's udder when the calf suckles.

### **The hot iron method**

This method is used most often on dairy calves, when they are between three and six weeks old. If you are worried that your calf will experience pain during the dehorning, you can request the veterinarian to assist you with local anaesthetic.

The tissue at the base of the horn bud is burnt with a debudding iron. The iron is heated over gas or fire. When the iron turns a dull red colour, it is pressed onto the bud and is twisted slowly in a circular motion for about ten seconds. If the horn bud is too large, you will have to remove the tip first with a clean and sharp pocket knife.

DO NOT only use knives and debudding spoons to dehorn a calf. These methods are known to result in open wounds and infections, and very often calves develop horn stubs afterwards.

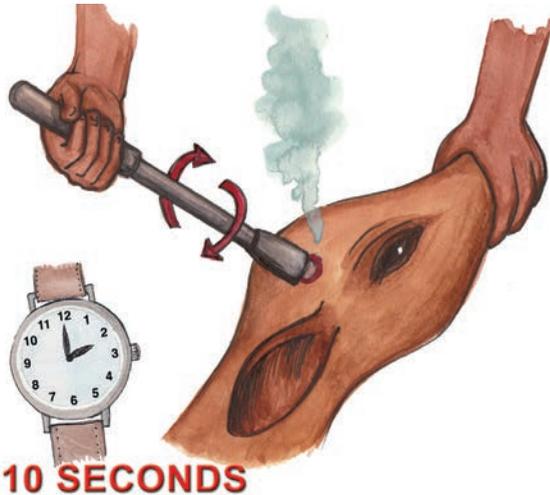
### **Important measures**

- The best time to dehorn is during late afternoon, when it is cooler. The wound will dry quickly, and there is less fly activity and less risk of infection. Do not dehorn in wet weather, because the wound will take longer to heal.
- Before you start dehorning, sharpen the blades of all the instruments and disinfect them in a bucket of antiseptic solution.
- Make sure that you know exactly what to cut, and where. A wrong cut can cause stress and infection.
- Hold the calf firmly during the procedure. If possible, use a calf cradle in which to restrain the calf. It will minimise stress and you can also use it later on for vaccination and marking.



### Hot iron method

- The hot iron method is used most often.
- Heat the iron until it turns a dull red colour.
- Hold the calf firmly.
- Press iron onto horn bud and twist slowly in a circular motion for 10 seconds.



### Caustic paste

- Apply the caustic stick method before the calf is 10 days old.
- Apply the soda to the horn bud carefully.

### Important

- Only use knives and debudding spoons to dehorn with the hot iron method.
- Tips can be removed with a clean, sharp knife.



## E. Castration of bull calves

**Bull calves and other young male livestock are castrated for a number of reasons. The farmer may want to prevent unwanted pregnancies on his farm, especially where livestock run in one herd.**

Bulls that have not been castrated, also tend to fight. They hurt each other and can cause damage to your fences and facilities. Castration can be done at any age, but preferably before the male animal is 12 months old. The best time is before the male calf is two months old.

### **Knife or open wound castration**

This type of castration is regarded as a safe method, but hygiene is very important. The lower part of the scrotal sack is cut off and each testicle is removed by cutting the membrane that encloses the testicle. The spermatic cord and arteries are cut off with a scraping action, by holding the knife at an angle and scraping a few centimetres until the cord breaks. This causes less bleeding. If there is too much bleeding, the spermatic arteries can be tied off. Remember that this method removes the testicles completely and cannot be reversed.

### **Elastrator rings**

A rubber ring is tied around the neck of the scrotal sack with a special instrument designed to do the tying. The testicles must be tied away from the body, towards the elastrator ring. After some time, the testicles and the tied back section of the scrotal sack will degenerate and fall off. This method can be used on calves between birth and ten days of age. The calf is handled easily and little labour is involved. The method is bloodless. However, at this young age, the testicles might still not be visible.

### **Burdizzo or bloodless castration**

A burdizzo is an instrument used to cut off the blood supply to the testicles. This causes death in the tissue cells and a degeneration of the testicles. The best time to apply this method, is at approximately one month old, when the spermatic cord can be clearly felt. The cord is clipped between the blades of the burdizzo. Clip only one cord at a time. The second cord should not be done at the same level to ensure normal bloodflow to the skin of the scrotum and to prevent dying off of the scrotal skin and even gangrene. The method is bloodless and there is seldom any infection. However, it does not work very well in older animals and requires two persons to do the job.

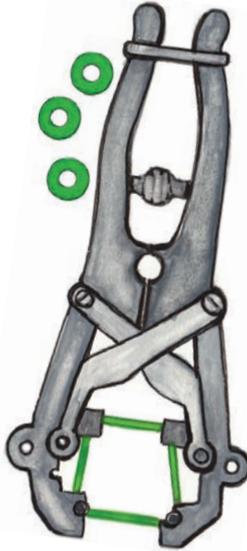
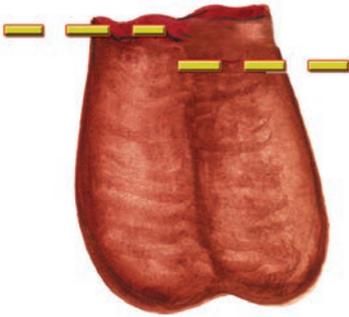
### **Wound care**

- Watch cattle closely for about ten days after castration.
- Beware of blowfly attacks and infection, especially if you are applying the open wound method.
- Treat the wounds with an antibiotic powder and fly repellent.
- If the swelling and pain are severe, and if the animal develops a temperature, ask your veterinarian for help. He or she will probably inject the calf with a suitable antibiotic.



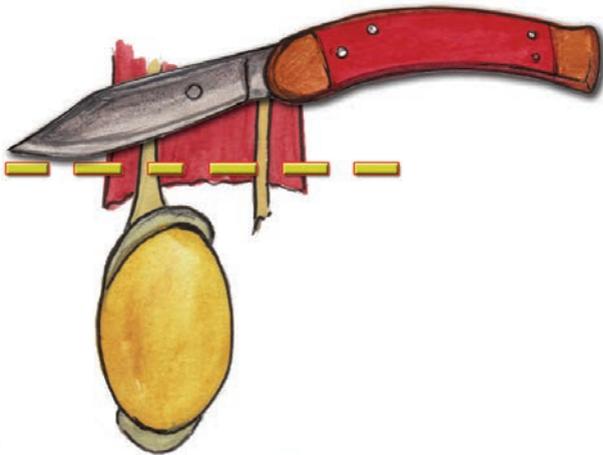
### Burdizzo

- The burdizzo cuts off the blood supply to the testicles.
- This method is bloodless.
- Apply when the calf is one month old.
- Cords should not be cut at the same level.



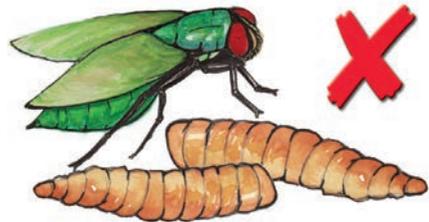
### Elastrator rings

- Rings are tied around the neck of the scrotal sack.
- Use this method on calves between birth and 10 days of age. (This procedure is more commonly used on lambs).
- This method is bloodless.



### Open wound castration (veterinary procedure)

- Scrotal sack is cut off.
- Spermatic cord and arteries are scraped off.
- This method causes some bleeding.



- Treat wounds with antibiotic powder and fly repellent.

## F. Care for your heifers

**Heifers can remain outside as long as the weather and soil conditions are good, but they must have access to adequate supplementary feed and some form of shelter.**

### Getting your heifer pregnant

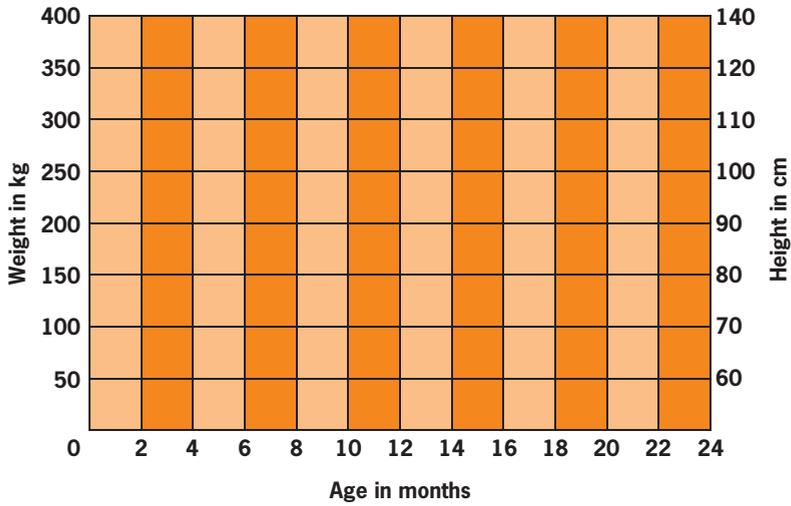
Heifers should be artificially inseminated at approximately 15 months, which means that they will calve at  $\pm$ two years (24 months) of age. Your heifer must be healthy when it is inseminated.

Heifers that calve too young often have more difficult calvings. The ideal calving time for heifers is between the ages of 23 and 27 months. Feed your heifer well for four weeks before and four weeks after insemination. This is a very critical period for heifers to receive high-quality feed.

### Things to remember

- Proper feeding during all developmental stages of the heifer is important to achieve the target breeding and calving age.
- Heifers that graze on grass can easily get internal parasites. If you do not have clean pasture available, a worm control programme should be applied.
- In late summer, pregnant heifers are very susceptible to summer mastitis. Once again, ask your veterinarian to help you with control measures.
- Do not introduce sudden changes in housing or diet, especially around the insemination period. A stressed heifer will struggle to become pregnant.
- Your heifers should be marked to allow you and the handler to identify them easily.
- Heifers should be placed with dry cows close to calving, at least four to six weeks before calving, to allow them to become used to the herd. If space is limited, they should not be housed with older cows, which will dominate the feeding and lying areas.
- Pregnant heifers should not be allowed to become too fat. This can cause difficult calving and less milk production.
- In the last two months of pregnancy, heifers should be observed carefully at least twice per day. Check for bleeding or other abnormal signs, and contact the veterinarian if you notice any of these signs.
- Heifers should always be housed in clean, dry conditions, or graze in a convenient, accessible field.

Keep track of your heifer's growth and progress, by using a **growth chart**. The chart will measure its weight and height.



- Measure its height from its withers to the ground.
- Measure its weight around the heart girth using a weight tape.
- Record its height and weight on the chart.
- Both measurements should increase steadily.
- Measure hip width.
- Measure hip height.

