12

Communicating with the calf

This chapter describes how to interpret the wellbeing of a calf from its behaviour and appearance.

The main points in this chapter

- Calves give many signals that indicate that they are in good (or poor) health and quick observations by the rearer can help treat any disease conditions early.
- It is important for rearers to form bonds with their calves so the calves will cooperate more fully, particularly following treatment for diseases.
- It is important for rearers to develop their own 'dictionary of calf language'.
- Rearers should learn to closely observe and interpret changes in both calf appearance and in their normal behaviour, which might be symptomatic of stress.
- Calf scours comes in many forms and colours, all of which can be used to help diagnose a cause.
- It is important to understand how calves react to people so that rearers' management practices can be changed accordingly.
- Farm owners and managers should communicate with their calf rearers.
- Developing a set of standard operating procedures, and writing them down, can help maintain consistency in managing and training new staff in the desired skills of calf rearing.
- Contract calf rearers can provide the right motivation and skills to rear calves better than staff on the home farm.

Success or failure in raising calves depends to a great extent on the rearers' attitude to the calves and their ability to react promptly to the calves' numerous signals (Figure 12.1). Interpreting these signals is a skill that can be easily learnt. Recent developments in calf rearing are directed towards reducing the average time spent with each calf. In many cases, at least part of that time saved would be well spent in observing the calves more closely.

Dairy farmers should develop a critical eye to observe the calves' behaviour and react to any signals the calves are showing. A good farmer understands these signals and needs to observe, analyse, improve and react. As a farmer once told me, 'A good calf rearer knows which calf will get sick tomorrow'.

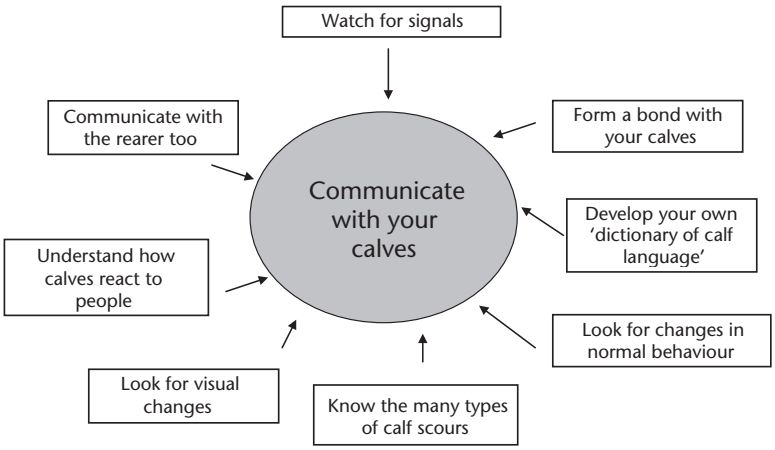

Figure 12.1. How to communicate with your calves

12.1 Signals to watch for

Do not let your senses idle when handling calves because many potential or actual problems may be picked up by close attention. Table 12.1 presents some of these.

Quietly talk, hum or even sing while you work, to help the calves become familiar with your voice. Scratch each calf behind its ear or underneath its throat. Later on, this rapport could help you convince a sick animal to eat or otherwise cooperate with you. Forming a bond with your calves is valuable in the long run.

When moving groups of calves around, remember not to try to move them from behind. Calves can see in most directions, but cannot see directly behind them, so always drive animals from the side. If you are directly behind them, they are likely to stop and turn around to see who is behind them. They always go in the direction they are headed, so calves should face the direction they are to be driven before any pressure is put on them to move.

When trying to get them through a gate, stand beside the gate. Once the calves are looking at you and facing the gate, step towards them and they will run through it to escape from you. Walking with the calves slows them down, whereas walking against the direction in which they are moving speeds them up.

Paying attention to the signals calves are constantly giving you enables you to improve your communication with them. Possibly, in time, you may develop your own 'dictionary of calf language'. Although it may not have too many entries, it may be of value to you from time to time.

There are veterinary treatments for most diseases whose symptoms become apparent through changes in calf behaviour and/or appearance, such as those described below. This chapter simply lists symptoms that may indicate the cause of the stress, while Chapter 11 deals with some of the veterinary treatments.

There are many suggested treatments for problems during calf rearing that do not always appear in the standard veterinary texts, such as using charcoal or cornflour to

Table 12.1. Using your senses to monitor the wellbeing of calves and conditions in the calf shed.

Sense used	Indicators of ill health or wellbeing
Eyesight	Bright and alert eyes
	Droopy or upright ears
	Soft and shiny skin and coat
	Panting and rapid respiration rates
	Abnormal discharges from eyes, mouth or body
	Whether navels and joints are swollen
	State of faeces residues on calves' back legs (colour and consistency)
	State of faeces on floor (runny, too clumpy)
	Any excess feed residues
	Willingness of calves to eat and drink
	Any abnormal calf behaviour
	Proportion of calves resting, standing or moving around
	If calves stretch when they get up
	General state of calf shed (drainage, ventilation)
	General tidiness and cleanliness of calf shed
Hearing	Grinding of teeth
	Bellowing
	Laboured breathing
	Coughing
	Unsettled calves moving around pens
	Dripping taps or water troughs
Smell	Abnormal odour of calves breath
	Odour of faeces
	Any other abnormal calf odours (infected hooves)
	Odour of whole milk or CMR powder
	Odour of bedding
	Odour from mouldy feeds
	Odour of air, hence state of ventilation
	Odour coming from poor drainage
Taste	Taste of whole milk or CMR solution
	Taste of concentrates and forages
Touch	Whether noses are dry
	Whether ears are warm, hot or cold
	General level of heat or cold stress for calves
	Any abnormal draughts
	Whether air is too damp, indicating poor ventilation
	Temperature of milk or CMR solution

reduce the incidence of scouring, or using ginger as a tonic for sick animals. Some of these are based on accepted medical principles, such as reducing the rate of movement of gut contents in scouring calves through increasing its viscosity. Others have evolved over

Calves can communicate with their rearers in many ways.

the years from folk medicine and as yet are either not fully understood or may even be discounted by mainstream veterinary science. That is not to say they do not work.

There is no harm in discussing them with veterinarians and experienced calf rearers. In fact this should be encouraged in the interests of better calf husbandry.

12.2 Changes in normal calf behaviour symptomatic of stress

- **The calf is charging your knees, running around the pen.** These signs characterise a healthy calf. It will do well for you.
- **The calf has a poor appetite at birth.** A disinterest in food shortly after birth is often related to traumatic events preceding or surrounding the birth. Do not wait for the problem to correct itself. Offer the calf high-quality colostrum by stomach tubing two or three times a day. Continue this treatment until the calf is ready to eat on its own. To prevent recurrence, review the nutritional program for the milking herd, particularly during the 60-day, non-lactating period preceding parturition, and correct for any deficiencies in protein, minerals and vitamins.
- **The calf is resting in an abnormal position.** About 1 hr after feeding, walk through the shed and observe the calves. Healthy calves rest in a curled-up position with feet tucked under and heads back along the body. They appear relaxed with regular

breathing rhythms. Any deviation from this standard should be judged with suspicion, although some healthy calves just rest flat on their side. A calf that lies flat on its side may need propping up to prevent the fluid from the stomach draining back to the oesophagus and then into the lungs. If its neck is stretched directly ahead, with front feet tucked squarely under its chest and its shoulders humped quite high, *Salmonella* may be a problem. A calf that curls its back up and down, with the nose pulled close to the body may have a sore throat.

- **The calf does not stretch when standing up after a rest.** Following a lengthy rest, a calf will generally stretch its legs when aroused and get up. If it does not, pay particular attention to it such as ensuring it drinks with its pen-mates. Lack of stretching is often the first sign of ill health.
- **The calf is disinterested in the food and surroundings.** This animal could be telling you that you have betrayed it in the past and you didn't react to its previous signals. The road to recovery would not be easy. Seek a diagnosis from your veterinarian and treat the calf as advised. Try to remove the original source of stress and, following veterinary advice, consider treating the infection (if this is the likely cause) with a broad-spectrum antibiotic if advised. Give the calf electrolytes to prevent dehydration, using stomach tubing if necessary. If a digestive disorder is the cause, a teaspoon of ginger (apparently known as Canadian tonic) may restore the calf's interest. Inject the calf with vitamin B and check that vitamins A, D and E had previously been given.
- **The calf lies with its neck stretched, front feet tucked squarely under its chest and shoulders hunched high.** This calf is likely to be suffering from *Salmonella*. Its temperature could have risen to 41°C and the calf would be generally weak and depressed. Foul-smelling diarrhoea, often green in colour, contains blood and later, pieces of intestinal lining. Unless the disease is identified and treated very early, 60% of infected calves usually die, and those that survive will perform poorly. Do not introduce new calves into a pen until all its previous inhabitants have moved on and it has been disinfected. To prevent infection in humans, high standards of personal hygiene must be maintained. This is difficult on seasonal calving farms where alternative calf-rearing sheds may not be available, but on year-round calving farms, a temporary smaller shed could be constructed.
- **The calf gulps the milk and chokes on it.** This occurs in calves that are underfed, under stress or have to compete for milk. Some calves will plunge their heads into milk buckets, splashing it all over the floor and inhaling some into their lungs. Offer a small quantity of milk at a time and, if possible, separate the calf from others. The gulping and choking usually stops once a regular feeding program is established.
- **The calf stops eating starter pellets.** Partial or complete refusal of calf starter may indicate that energy needs have been fully satisfied by liquid feeds. Stress or a severe case of digestive or respiratory disorders may have the same consequences. Prolonged treatment with certain drugs (such as sulpha drugs), particularly given orally, may impair rumen microbial activity and thus temporarily reduce starter intakes. If all calves refuse it, feed quality may be the problem. Check for mouldy and/or musty concentrate ingredients (if using an on-farm mix). Excess minerals can also reduce its palatability, which can be improved with molasses.

- **The calf is kicking the belly area with its hind legs.** This indicates pain in the abdominal area. The source of the pain could be twisted stomach, constipation, urinary calculi (kidney stones) or bloat. Desperately seeking relief, the calf with a twisted abomasum frequently lies down and jumps up. To help, place the calf on its back on heavy straw bedding and, holding the front and hind legs, roll it from side to side a few times. A constipated calf frequently strains and bellows loudly while trying unsuccessfully to pass manure. If the calf is not drinking, give it water or electrolytes using a stomach tube. Urinary calculi could be suspect if substantial deposits of mineral salts are deposited on the sheath (of bull calves) and the calf tries to urinate frequently.
- **The calf is unable to stand or even raise its head.** Examine the calf thoroughly for possible soreness, such an injured knee, displaced joint, infected navel, and so on. If it cannot even raise its head, this may indicate complete exhaustion due to a long battle with pneumonia or scours. If the calf has a normal body temperature and a history of good health, it could be due to muscular dystrophy through a deficiency of selenium. Once treated with selenium and vitamin E, the calf could be back on its feet within 24 hr.
- **A calf is drinking the urine from other calves.** Pizzle sucking is a vice usually related to an unsatisfied sucking instinct, particularly in early-weaned calves. This problem can be largely overcome by tethering calves during milk feeding, using rubber teats or keeping calves separate till well past weaning. Hanging a piece of chain in pens may also be effective in group housing systems.
- **The calf is resting in the corner of the pen, with its head turned away from its pen mates.** This animal should not be ignored. First, get the calf up and if it stretches, it is fine. If it doesn't, then it requires attention. The calf may be at the bottom of the social hierarchy in the pen and should be moved in with smaller or less-aggressive calves. If the shed offers poor protection against the wind, this corner may be the warmest area of the pen and all calves will tend to congregate there.
- **The calf is shivering with its hair standing up along its back.** This animal is suffering from cold stress and should be better protected from draughts or provided with thick, dry bedding and a source of heat. If only one or two calves show these symptoms, check their body temperatures. Calves may shiver in very cold weather if fed milk at too low a temperature.
- **The calf has an increased breathing rate at normal air temperature.** Increases in respiration rate in hot weather are expected. Some of the best gaining calves can have higher than normal rates as they consume more feed and require extra oxygen for its assimilation into body weight gain. Normal breathing rates in temperate regions are 56/min at 4 days, 50/min at 14 days and 37/min at 35 days of age; such data is yet to become available in tropical areas, but anything less than 50 or 60 breaths/min would be considered normal. In the majority of cases, calves with increased breathing have reduced lung capacity due to respiratory problems such as pneumonia. Increased body temperatures often accompany these disorders.
- **The calf is standing with its front legs spread out and head stretched ahead.** These are important signs of a lengthy bout of pneumonia. Only a portion of its lungs are functional and the spreading of the legs allows the calf to try and secure more volume

for the lungs to make breathing easier. If the above symptoms are accompanied by a heavy discharge from the nose and frothy saliva is running from the mouth, then damage of lung tissue has probably been irreversible. Another symptom of pneumonia may be an arched back, with the calf moaning.

- **The calf grinds its teeth.** You are dealing with a calf which has lost the will to live after suffering from extended pneumonia, scours and/or chronic bloat. The chances that you will save it are very slim. Give the calf an isolated, warm pen with fresh feed and water. Do not spend too much money on additional medication. Another pre-death symptom is temporary or permanent loss of eye muscle control, described as 'sky or star gazing'.
- **An otherwise healthy calf is suddenly found dead.** Though many causes may be involved, lead poisoning is a likely suspect. Consumption of only 150–200 mg of lead represents a lethal dose. Sources of lead include discarded car batteries, certain herbicides, discarded paint tins or painted woodwork. Calves that have ingested only small quantities of lead and are still alive, look dejected, dull and have sunken eyes. They often show abdominal pain and grind their teeth. Treatment is available from veterinarians. Pulpy kidney is another possible cause of very rapid death.

12.3 The many types of calf scours

The characteristics of calf faeces can be a good indication of the type of digestive disorder being suffered. Here are a few examples:

- **Blood is present in the faeces of the newborn calf.** The inner lining of the intestine of a newborn calf consists of immature cells that are replaced within a few days after birth by more permanent ones. During this period, the fragile blood vessels can easily break. When the broken vessel is close to the end of the gut, bright red blood appears in the faeces. If bleeding is excessive, an injection of vitamin K (a blood coagulating agent) can be given. Otherwise the occasional appearance of blood in faeces should not be of great concern. When excessive bleeding is accompanied by high temperature and scours, coccidiosis or salmonellosis may be occurring.
- **The calf has white or yellow scours.** This suggests that a number of the classic pre-scour signs, such as loss of appetite, depressed appearance, facial hair standing on end, were missed. Among the possible causes of scours are inadequate colostrum, overfeeding, overcrowding, poor sanitation and general stress. If the scouring was the result of inferior milk replacer, the volume of faeces will be usually large with a gelatinous consistency.
- **The calf has watery scours.** Mild cases of watery scours, usually lasting 6–12 hr, are often seen in purchased calves after about 5 days in the rearing shed. They are connected with the change in diet, stress or by slight overfeeding. Sometimes the faeces contains blood stains originating from a broken vessel.
- **The calf has bloody scours and it is straining to pass manure.** The presence of blood in the faeces may be of no significance or it may indicate serious infections from *Salmonella* or *Coccidia*. If a calf that is 14 days or older has a normal or slightly

elevated temperature, but its watery faeces contain large clots of fresh blood or dark tarry blood staining, it is likely to be suffering from *Coccidia*. The infectious agent is a common opportunist that is present in more than 50% of healthy calves. The incidence of coccidiosis rises on farms where calves are subjected to early confinement and are exposed to massive infections at an early age. This is a stress-related disease and usually indicates a poor rearing environment.

- **The calf has loose, dark brown stools.** This usually indicates bleeding from lesions and ulcers in the abomasum or a serious infection in the digestive tract. When bleeding takes place in the abomasal area, medication seldom helps. Use gastric and intestinal protectants containing kaolin, pectin or bismuth. If the calf is eating solid feeds, reduce the acidity in the gut by feeding less grain and more roughage.

12.4 Visual changes in calves symptomatic of stress

- **The calf's eyes are bulging.** The eyes in some newborn and young calves protrude from the eye sockets, giving it an appearance similar to people with a thyroid disorder. Fortunately, bulging eyes in calves indicate a good supply of body fluids and a scour-free history. If the calf is healthy and attentive, bulging eyes should not discourage you from purchasing it.
- **The calf has droopy ears.** This animal is likely to be running a high temperature because of pneumonia or a digestive disorder. Check the temperature and, if it is high (above 39.7°C), the calf should be immediately treated with a broad-spectrum antibiotic. If one ear droops, check for external parasites such as lice and treat them with a few drops of hydrogen peroxide. If the base of the ear is swollen or tender, use a teaspoon of warm olive oil and gently work it into the skin. Any discharge from the ear usually indicates an infection that could be treated with penicillin.
- **The calf has facial hair standing on end.** When first observed in a previously healthy calf, this usually indicates an imminent digestive disorder. It is likely that the calf will be scouring within 24 hr. Skipping one milk feed (if twice daily feeding) and replacing it with electrolyte may help. If the calf was purchased with facial hair standing on its end, or if it is a permanent fixture, the calf has possibly had lengthy pneumonia and is still not feeling well.
- **The calf has sunken eyes and its skin has lost its flexibility.** The problem is dehydration and it has not been recognised or treated for the last few days. Prolonged scouring leads to substantial loss of body fluids, as well as electrolytes. The body of a young calf contains 75% water and a loss of 10% puts its life in danger, while a loss of 15% results in death. Sunken eyes are one symptom of dehydration, which, if advanced, will cause the upper eyelashes to be directed towards the inside of the eye socket, obscuring the calf's vision. The level of dehydration can be checked by pinching a bit of skin near the ribs and twisting it 90 degrees. The slower the fold of skin springs back to its original position after release, the higher the level of dehydration and the quicker the need for treatment. See Table 11.1 for further details.

- **The calf has lost hair around its muzzle and/or rectum and along its hind legs.** Offering hot milk to the calf or letting the manure stick to the skin for a long time are often stated as the main reasons for loss of hair. If these two causes can be excluded, poorly emulsified fat in milk replacer is a likely suspect. Fat globules attach themselves to the skin and prevent the air reaching the hairs. Similarly, hair is lost around the rectum when it is in contact with the undigested fat in the manure. Low digestibility of fat in milk replacers containing high levels of non-clotting plant protein may have the same consequences. If the flesh is raw, wash it with a clean cloth, wrung out with soda water. The whole area should be treated with a weak solution of iodine.
- **The calf bloats after drinking milk.** Under certain situations, the oesophageal groove does not close completely, thus leaking milk into the rumen. This can occur through rough handling, feeding milk that is too cold or too hot, overfeeding or force feeding when the abomasum is not sufficiently empty. It can also occur when the calf is sick or when fed poor-quality milk replacer. Feeding milk through rubber teats, or at regular intervals, at body temperature, and in small quantities may help re-establish the proper function of the oesophageal groove. Letting the calf suck your finger for a moment before offering the milk bucket will also help.
- **A weaned calf bloats on *ad lib* grain feeding.** The sudden accumulation of gas in the rumen that cannot be expelled can even occur in calves that are well adjusted to high-grain diets. Within 1–2 hr after feeding, the left flank rises very quickly, the calf nervously lies down and tries to defecate. If only one or two calves bloat, then it is unlikely to be due to the feed or feeding practices. Some calves are just prone to bloat and will get over it without any treatment. Regrouping calves may allow previously submissive calves better access to the grain, which can upset rumen gas expulsion if this happens too quickly.
- **The calf has a foul-smelling greenish liquid dripping from its mouth and it loses its cud.** This is sometimes called 'medicine disease' and is caused by prolonged use of antibiotics, which upset the balance of rumen microbes. The best option is repeated introduction of a cud from a healthy animal, preferably on the same diet, into the sick calf. A similar effect, called 'microbe swapping', can also occur during hand feeding of calf starter in newborn calves. Some rearers consider that the dripping is caused by calves twisting their heads to the side while drinking from rubber teats. This can cause the oesophageal groove to malfunction, thus allowing milk to enter the rumen and upset the establishment of normal populations of rumen microbes. Another possible cause is damage to a large portion of the rumen wall by prolonged scouring or the presence of small pieces of wire.
- **The calf develops a pot belly.** This indicates a long-term nutrient imbalance, in that there is too much fibre and too little energy in the diet. High-fibre diets require high water intakes, which together with the slowly digested feed increase rumen volume. Energy intake is further reduced through a limited gut capacity and this leads to poor growth. Sometimes pot bellies develop in calves suffering from internal parasites, those with a damaged gut from chronic scouring or those with a long history of pneumonia. The obvious treatment is to feed more energy and less roughage. By

feeding *ad lib* concentrates and a low-quality roughage, calves will only eat about 10–15% of their diet as fibre and the rest as concentrates.

- **The mouth cavity and skin under the calf's eyelids are pale.** Calves fed milk exclusively will show signs of anaemia, due to the low iron levels in the diet. Once eating solid food, this problem will disappear as concentrates contain sufficient iron for calf requirements. If growing calves for white (milk-only) veal, intake and performance can suffer through anaemia. This can be corrected, without endangering the marketability of calves, with intramuscular injections of iron.
- **The calf has a dry, hot muzzle.** This calf would have a high body temperature and most likely be suffering from a respiratory disorder. Electrolytes and antibiotics would probably help.
- **The calf has a nasal discharge.** A transparent, watery discharge indicates the calf is, or was, exposed to significant environmental, housing or nutritional stress. The cause of the discharge is usually a viral infection, like a human cold. Remove the source of stress and if the body temperature is elevated offer three adult size aspirins per day. If the colour of the discharge changes to brown or greenish and is thicker, then the body is already fighting a secondary bacterial infection.
- **The calf's temperature dropped after treatment but rose again a few days later.** This could be due to several possibilities:
  - The correct treatment was applied but for too short a period.
  - The treatment was applied once each day whereas twice-daily treatment would have provided better uniformity of antibiotic release.
  - The level of drug applied was insufficient.
  - A combination of the chosen antibiotic along with an anti-inflammatory drug was administered and the temperature drop was solely due to the anti-inflammatory drug, which may have masked the improper selection of the antibiotic.
    It is important that the veterinarian should identify the disease organism responsible for the stress to ensure the most appropriate treatment can be given.
- **The calf has saliva running from its mouth.** This could indicate many disorders, but is mainly connected to severe pneumonia. The front legs are spread, the neck is stretched, the head points to the ground and breathing is laboured. Saliva will be running either in a clear steady stream or as a slow-moving liquid. In many cases, even dramatic measures cannot save such a calf. Move it to a well-ventilated isolation pen, provide good bedding and fresh feed and water. Veterinary attention is essential.
- **The calf has an umbilical hernia.** Hernia or rupture is a protrusion of one or two loops of intestine or other tissue from the abdominal cavity through the navel opening. If such an opening is no more than 2.5–4 cm, it usually closes sufficiently when the calf grows older. Larger openings require surgical correction. Taping the opening for a period of 4 weeks may be necessary if the hernia is two fingers wide at 2–3 months of age. Application of rubber rings (used for tail docking in lambs) to the skin pouch only are effective in heifer calves. Use of more than one rubber ring prevents them from sliding down. The rings stop the blood supply to the navel and in 2 or 3 weeks the navel cord will fall off and the connective tissue will close the opening.

- **The calf has warts.** Warts are a specific skin overgrowth caused by a viral infection. In calves they sometimes appear on the head, the ears and around the mouth and eyes. They are contagious to other animals and some can even be transmitted to humans.
- **The calf has manure accumulation around its hooves.** Dry clusters of manure can have very unpleasant consequences. They can cover an infection, be filled with fly maggots or lead to abnormal wear of the hoof. The feet should be checked at regular intervals using a blunt edge of a putty knife to remove the manure between and around the hooves. If the skin under the removed manure is red, mouldy or smells, wash it with diluted iodine.
- **The calf's mouth is cold.** You are losing this calf. The body defences are breaking down and infection is taking over. The body temperature is well below normal, usually below 35°C, and the chances of recovery are very slim. In an attempt to raise its temperature, try thick, dry bedding, or plastic bags filled with warm water or heat lamps while lukewarm milk and/or water could be offered. Do not raise your hopes too high.

12.5 Understand how calves react to people

How much do we really know about the basic sight and hearing senses of calves and heifers? An article by two US calf-rearing specialists (Leadley and Sojda 2001) tells us much of which we may take for granted, but, on the other hand, may not even be aware of. Firstly, cattle have wide angle vision: they can see 300 out of 360 degrees around them. They use this field of vision to define their 'personal space', which we call their 'flight zone'. Secondly, cattle are quite sensitive to high frequency noises, and compared with people (who can hear noises from 1000–3000 hertz), they can hear noises up to 8000 hertz. The authors have listed some general rules to help with cattle handling:

- When a person moves into their flight zone, cattle will normally try to move away.
- The size of their flight zone will decrease slowly if they are handled frequently and gently.
- Previous experiences will affect how animals react to future handling, with memories persisting for many months. Obviously memories involving fear are significant in increasing flight zones.
- Calves can readily tell the difference between two situations and make choices to avoid the more stressful one.
- Cattle are sensitive to changes in colour and texture.
- Moving objects and people seen through sides of a chute can frighten animals.
- Novelty is a strong stressor, while repeated exposure will reduce the novelty effect.
- Cattle are herd animals and do not like to be separated from their herd mates.
- Groups of cattle that have body contact remain calmer.
- Unexpected loud or novel noises can be highly stressful.
- Cattle readily adapt to reasonable levels of continuous sound such as background noises or music.

- Cattle exposed to a variety of sounds, such as radios with talk and music, may have a reduced reaction to sudden noises.
- Cattle readily adapt to handling, even if the events may be initially stressful, such as walking up a race, into a head bale or being transported.
- Cattle can be trained to voluntarily accept restraint with relatively low levels of stress.
- A small amount of inconsistency in care and handling can reduce calves' stress response to new sights and sounds.
- Consistent poor handling can create chronic stress.

Calves require handling techniques different to those used with adult cattle; hence, an experienced handler of adult cattle will not necessarily have the skills to handle calves. Calves spend 90% of their time lying down and sleeping and do not have herding and following behaviour of adult stock. They do not have a flight zone and they are often not fearful of humans. In fact, they are more likely to move towards people because they associate them with food. They move independently of each other and their movements can be unpredictable. In addition, calves are inquisitive and can be easily startled by noise.

Calves must never be:

- thrown, dropped or dragged
- struck, hit, punched or kicked
- shocked with an electric prodder
- moved by dogs.

Because calves respond to a quiet and reassuring voice, calf handlers should move in a slow and predicable manner. Calves should be handled patiently and quietly to reduce stress and risk of injury. A high degree of kindness and empathy is needed when working with calves to reduce stress and risk of injury.

These basic rules can partly explain why empathetic calf rearers do a good job, whereas insensitive rearers do a poor job. Just spending time with young calves, particularly newborn ones, develops that essential bond, while quiet consistency in all management procedure, even to the point of clothes worn in the calf shed, ensures the calf nursery is as peaceful as any infant's bedroom.

12.6 Communicate with your calf rearer too!

Farm managers and other employers of farm staff should be aware that praise is one of the best motivators for employed labour. When your calf rearer does a good job, be certain to say frequently out loud and face to face, 'Thanks for doing a good job!'

Proficient calf rearing requires use of the fives senses (sight, smell, hearing, touch and even taste), and this takes time to develop. Calf rearers have to be extra alert and ready to act quickly when a calf is ill. Timely diagnosis and treatment are measured in minutes rather than days. This kind of care calls for lots of flexibility and commitment on the part of the calf rearer. Good calf rearers have a bond with their calves that is tied to this commitment.

Giving that 'little extra' over and over again, week after week, is costly for the rearer. It means being continually alert when working with the calves, so sick calves are quickly

identified and treated. It may also mean returning to the calf shed at night to administer antibiotics or electrolyte fluids. Like all aspects of dairy farming, flexibility is a key attribute in calf rearing, where all staff must prepare for the unexpected. We all like to work to routines, particularly employed labour, but all too frequently emergencies can occur and daily work schedules must be quickly modified.

Owners and managers must allocate sufficient labour resources at the right time and place; for example, when assisting in calving, time should be allowed for dipping the navel with iodine and dosing newborn calves with colostrum. Farmers should also provide opportunities to spread out stressful events rather than stack them one on top of another. For example, vaccinations, dehorning, tail docking, ear tagging and weaning are all stressful to the calf, and even to the rearer if it requires continually handling and restraining calves.

When selecting or constructing rearing facilities, rearers should also be kept in mind. Ensure that staff can easily see all the calves during a single patrol down the calf shed. Provide enough hot water for cleaning buckets, teats and other feeding equipment, and cold water outlets from which calves can drink. Importantly, provide good quality and palatable feeds, such as concentrates, roughage and milk replacer. If calves quickly develop a taste for solid feeds, they require less labour input and are less likely to suffer ill health.

Skilled, motivated and empathetic staff are a major contributor to a successful calf-rearing operation. However, because no one is born with such skills, they must be learnt through experience. Therefore it should be assumed that, until a farm worker can successfully demonstrate a particular skill, he or she does not have it. In teaching any new farm practice to workers, explain why it is done this way so they can better understand the skill, and then ask them to repeat it, showing that they can successfully do it in the way they were shown. Remember that learning a new skill depends on being shown how to do it correctly.

12.6.1 Developing standard operating procedures

A standard operating procedure (SOP) is a formal term used to describe a set of instructions for any activity or set of tasks undertaken in the workplace. It should be described in sufficient detail that any non-skilled person could attempt to undertake it. Such SOPs can be developed in such as a way as to undertake the most suitable procedures to achieve the most desirable, or best possible, outcome, in which case they become best management practice (BMP). A series of BMPs are presented in Chapter 18 of this manual to describe the entire range of activities involved in calf and heifer rearing.

It is important to develop SOPs for major farm tasks because on large farms they are likely to be carried out by more than one farm worker. Calves, as well as farm managers, perform better when all farm practices are undertaken in a routine manner. The benefits of SOPs include:

- They lead to consistency even when undertaken by different people.
- Calves perform better if routines do not change.
- People thrive on consistency as they know exactly how to do any job and what the outcome should be.

- Training new staff is easier because there are a series of carefully documented steps to achieve that outcome.
- Because they are written down, any member of the farm staff can refresh their memory on how to perform the tasks.
- They can be referred to by managers to follow through any farm activity that did not give the desired outcome.
- They can even be used as legal documents in the case of formal disputes.

Generic SOPs can be developed for any set of tasks, but the best ones are those developed by the staff (workers and management) actually doing it, because they are most familiar with the farm operations and the infrastructure, equipment and methods used on that farm.

Fisher (2009) describes a simple approach to developing an SOP, as follows, **using the example of maximising passive transfer of immunity through colostrum feeding**:

- Prioritise the areas that would benefit from an SOP, namely those that would most benefit from a series of clear written protocols [**calving down cows and heifers**].
- Select the most appropriate farm staff to oversee the development of the SOP, obviously those with overall responsibility for that task [**colostrum feeding and milk feeding**].
- Ensure that anyone likely to undertake this task is involved in its development [**other farm staff involved in calf rearing and animal health**].
- Make a list of processes, within the selected area [**such as colostrum collection and quality assessment, storing colostrum**].
- The extent of what the SOP covers and what is does not [**does it cover cleaning and sanitising feeding equipment, does it cover cleaning udders?**].
- Give the SOP a specific name [**maximising the passive transfer of immunity**].
- Detail its scope [**as above**].
- Prominently list hazards that exist and precautions that should be taken [**None**].
- Detail any safety equipment or protective clothing required [**None**].
- List all equipment and supplies needed [**buckets, colostrum quality measuring equipment, stomach tubes or nipple bottles**].
- Detail in sequence, the steps needed to be taken to achieve the desired outcome [**these can be summarised from Chapter 5 of this manual**].

Once completed, the SOP can be briefly summarised and placed on the wall of the calving down pens. The more detailed SOP should be located in the farm office and also the staff quarters. This should be reviewed say every 12 months and updated to remain pertinent to the task.

12.7 Contract calf rearing

Dairy farming is becoming a specialist profession requiring many skills. Rather than keep up to date with all these skills, increasing numbers of farmers now outsource particular enterprises on their farms. Contractors now offer their services in forage conservation, milking, heifer rearing and, more recently, calf rearing. Skilled rearers

collect newborn heifer calves from the farm, milk rear them and return the weaned calf at about 12 weeks of age, weighing 100 kg. The rearer is often provided with transition milk with which to commence milk feeding, but then the diet is changed to milk replacer. Early weaning, at say 5 weeks, would reduce total feed costs.

Recipient farms have to be selected carefully to minimise the introduction of diseases, thus reducing the rearer's concern about spreading diseases among the contracted calves. They should draw up formal contracts, or at least agree on the costs of disease treatment and mortalities, and target live weights. Rearers generally bulk purchase milk replacer and calf pellets, so they often develop good alliances with manufacturers.

In some instances, calf rearers contract to rear the calves on the home farm, thus providing only the labour and expertise, while using all the farm facilities, including transition and vat milk.

There may also be a role for the specialist farm midwife, whose job it is to routinely check the springing cows and provide assistance with calving. They can assist with natural suckling of newborn calves or remove them at birth to sheltered pens, and artificially feed them their first colostrum. Such a position may need only work for several months each year and that person could contract to do it on several farms in close proximity. The costs involved in employing such a farm midwife would be offset by the reduced time spent with the calving cows and their progeny (particularly late at night). There would also be the added benefit of reduced health problems and mortalities arising from a guaranteed higher level of passive immunity among the replacement heifers. The details of contract rearing of weaned heifers are discussed in Chapter 13.

12.8 Codes of animal welfare for calves

Throughout the world, public perceptions of farm animal welfare issues have the potential to affect the sustainability of livestock industries markedly, with national and international pressures likely to have increasing roles in determining how animals are managed. Because farm animal welfare is largely part of good animal and farm management, paying close attention to their day-to-day management should also ensure acceptable welfare.

Calves born to dairy cows are routinely submitted to more insults to normal development than any other farm animal. They are taken from their mother generally within their first day of life, often not even allowed to suckle colostrum immediately after birth, and are frequently deprived of their most natural feed: whole milk. They may be fed one of the varieties of cheaper liquid substitutes for milk, but, because these are still more expensive than solid foods, many are weaned off milk as quickly as possible.

Of all the classes of dairy stock, the welfare of milk-fed calves has received the closest scrutiny. The following summarises the current Australian codes for their health welfare and wellbeing (Moran 2002).

12.8.1 Housing

- Housing should be hygienic, with adequate ventilation, climate control and lighting. Flooring should be well drained with adequate dry lying space for each cow. Flooring and internal surfaces should not cause injury and should allow easy cleaning.

- Calves should be given access to sufficient bedding or appropriate flooring that ensures comfort and a clean, dry place to lie.
- Feeding systems should be designed to permit easy access and reduce bullying.
- The floor area must be sufficient to enable each calf to freely turn around, stretch and lie down comfortably. A floor area of at least 1.5 m^2 should be provided for each calf individually housed in pens or cribs. Pen heights should be a minimum of 1 m with provision of additional height to allow for ventilation space.
- Calves, being social animals, seek the company of other calves, so should be able to see other calves during early rearing.
- Where large numbers of calves are reared, they should be grouped by age and size to reduce competition for food and to allow closer observation and management.

12.8.2 Feeding

- Calves require at least 2 L of fresh or preserved colostrum within the first 12 hr following birth. Calves should continue to receive colostrum for the 3 days after birth.
- Thereafter, they should be fed at least daily on liquid milk, or milk replacer, in sufficient quantities to provide essential requirements for maintenance and growth.
- Hay, calf concentrate or high-quality forage should be available to calves no later than 3 weeks of age to help in the development of their digestive tract and to ease the stress of weaning.
- Calves should be weaned off milk or milk replacer onto rations providing all essential requirements only when their ruminant digestive systems have developed sufficiently to enable them to maintain growth and wellbeing.

12.8.3 Management practices

- Restraint should be the minimum necessary to perform management procedures efficiently.
- Procedures and practices that cause pain should not be carried out if painless and practical methods can be adopted to achieve the same result.
- Special care should be given to the practices of castration, tail docking (if undertaken) and dehorning.
- Any injury, illness and distress should be promptly treated.
- Appropriate preventative measures should be implemented for diseases likely to occur in the herd. A suitable vaccination, and internal and external parasite control plan should be devised and followed for each farm.
- Internal medication, such as vaccines and drenches, and external medications, such as dips and pour-on formulations, should be stored and given in strict accordance with the manufacturer's instructions and recommended methods of administration. Overdosing may harm cattle, while under-dosing may result in failure of the medication. Expiry dates and withholding periods should be strictly observed.
- The preferred method of humane destruction (euthanasia) of cattle should be by overdose of anaesthetic or using a gunshot.
- Killing day-old calves may also be achieved by a heavy blow to the crown of the head to stun the calf prior to bleeding out.

12.8.4 Transportation of calves

- Transportation of stock should ensure that they reach their destination as speedily as possible, within the confines of the road laws, and in a condition not significantly less than when assembled for loading. The possibility of either injury or illness during transport should be reduced to a minimum.
- Handling of calves should be carried out in a manner that will avoid injury or unnecessary suffering. Calves are not to be kicked, beaten, pulled, thrown or prodded with any sharp instrument. The use of electric goading devises or dogs when handling, driving, drafting, weighing, loading or unloading calves is not an acceptable practice.
- Facilities should be constructed to permit safe loading and unloading of calves.
- Places where calves are held should have facilities and/or contingency plans to feed calves in the event of delayed removal or slaughter.
- Calves should be fed at least every 24 hr and have access to drinking water.
- The driver of the vehicle is responsible for the care and welfare of all animals during transportation.
- Animals that either become ill or weak, or are injured during transport should receive appropriate attention and treatment; if necessary, they should be slaughtered humanely.
- Vehicles used for transportation should be thoroughly cleaned prior to loading and at the end of the journey.
- Transport operators should check calves en route at least every 3 hr.
- Calves should be loaded at a density so as to allow all calves to lie down while being transported.

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