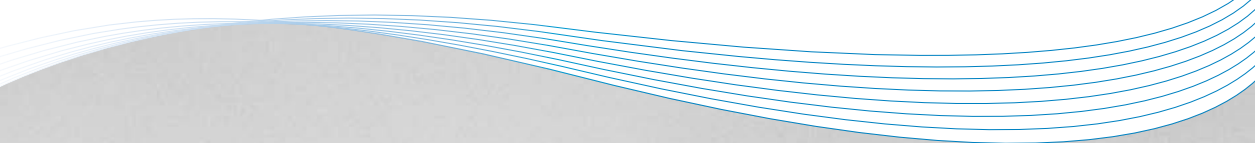


BETTERRETURNS



Improving cattle handling for Better Returns



BEEF & LAMB

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Introduction

Effective management of cattle relies on husbandry and veterinary jobs like weighing, vaccination, condition scoring and dosing being carried out at the right time to get the maximum benefit. Most of these jobs can only safely be done if cattle are put through a handling system.

- Is handling cattle something you look forward to or loathe?
- Does it require advanced planning to get hold of additional farm staff, family and friends or can you manage safely with existing labour?
- Does it require a major reorganisation of gates, crushes, tractors or can you be ready to work in minutes?

Every farm needs a system that is safe, simple, efficient and effective to operate so that handling is a positive event for you and your staff. We also have a responsibility to present cattle safely for veterinarians and inspection bodies, and handle animals in a way that presents the minimal welfare challenge to the cattle themselves.

There is a complex interaction at play between the handler, the animal and the hardware when we handle livestock. This manual looks at these three key areas and should be relevant if you are troubleshooting or tweaking existing systems and practices or designing a new system from scratch.



Miriam Parker
Livestockwise Ltd.

Why good handling matters

Effective handling improves the safety of those working with cattle, enhances animal welfare, reduces labour requirements and raises efficiency. Stress and poor handling also reduces returns by impairing the quality of the meat.

Health and safety

Being injured by an animal continues to be one of the main causes of death on the farm. The risk increases with age: those over 65 are at greater risk; however, the young and inexperienced are also vulnerable.

People who work alone run the risk of taking on more than can be managed, but there is also a lack of immediate help if something were to happen.

Accidents can happen with all categories of animals, but particularly bulls and cows with calves.

Important safety points are highlighted in a red box throughout this booklet.

Reduce stress

Stress

Consumers tend to select meat based on colour and appearance and often avoid very dark meat. High levels of stress during the 48 hours before slaughter can cause dark cutting beef.

The meat is dark in colour and has a dry, sticky feel. These quality problems make the meat less attractive to the consumer, of poorer eating quality and give it a shorter shelf life.

The following contribute to dark cutting beef:

- Mixing
- Changes in temperature
- Poor transport
- Rushing
- Improper use of handling aids

To avoid stress:

- Always handle animals quietly
- Avoid mixing cattle from different groups
- Maintain facilities
- Provide non-slip flooring
- Avoid overcrowding

Bruising and carcass damage

Improper use of any handling aid can result in injury and bruising. This can cause the animals pain and there may also be damage to the carcass. Bruised carcasses need extra trimming, which takes time and reduces carcass yield. In extreme circumstances, it can result in partial rejection of a carcass.

For more information, see **Marketing prime beef for Better Returns**, available at ahdb.org.uk



Dark cutting beef (top)

Reduced labour and improved efficiency

With a good system design, fewer people are required to handle stock safely and efficiently.

The cattle move easily through the system and there is less 'non-effective' behaviour, such as stopping, or attempting to turn or jump, which all increase the handling time.

Invest in your system so that you can work safely on your own and if assistance is required, know that family, employees or the vet can be safe too.

Achieving harmony

Handling cattle can be a major stressor at any time. Three elements must work in harmony for handling to be a safe, low stress activity.

Animals

Individual animals cope differently with the handling process. Breed, sex, stage of production, age and previous experiences will all influence behaviour.

Achieving harmony

People

Your behaviour influences how the cattle might subsequently behave.

Facilities

The way facilities are designed and constructed can affect how easily animals move.



The animal's viewpoint: senses

Manipulating cattle to get them to go where we want requires an understanding of animal behaviour. What animals do is important for their survival and is influenced in three basic ways.

Sensed behaviour

Sensed behaviour is based on information that animals pick up from their surroundings. The animal hears, sees or smells something (a stimulus). It assesses the situation and then responds. The animal will usually run away from a threatening stimulus, or have a look if a stimulus is interesting, like food.

Vision

Cattle have eyes at the side of the head, giving them a narrow, binocular field of vision at the front. This is why they usually turn to face any perceived threat, including a handler.

Do cattle see colours?

Cattle can discriminate between certain colours and are dichromate, i.e. they see only two of the three primary colours (yellow/green and blue/purple). Dichromatic vision may provide better night vision and aid in detecting motion.

Smell

With their good sense of smell, cattle will sniff at new or strange objects and surroundings. Within the handling system, this may cause them to halt or hesitate.

When planning handling facilities, take account of the prevailing wind, which may carry strange, distracting smells.

Hearing

Cattle hear sounds at similar or higher frequencies to humans. They dislike unfamiliar, loud noises.



Animals: instinct flight or fight

As farmers, we can mostly rely on, and work with, the animal's instinctive behaviour, herding, grazing behaviour and maternal instincts. However, instinctively handling animals – especially cattle – through any system can provoke fear.

Fear produces an alarm response. There is a release of hormones (for example, cortisol, adrenaline) into blood, saliva and urine. The heart rate, respiration rate and body temperature all increase as the body prepares for flight, fight or freeze.

There are many things that can cause fear in cattle:

- Instinctive fears – e.g. isolation, falling, confinement and restraint
- Novelty – e.g. strange objects, new places, sights, smells and sounds
- Fears based on previous experience – e.g. pain
- Signs of fear in other cattle
- Predators, or predator-like behaviour, which can include people

Arousal is the term used to describe an animal's level of activity, ranging from sleep at one end of the scale to flight (or fight) at the other. Any handling raises arousal – the key is not to trigger a fear response.

Anxiety is often associated with dread or uncertainty, as opposed to fear, which is usually caused by something specific.

For cattle, success in life depends on the right balance of curiosity to develop survival skills and caution to avoid danger. Cattle on the farm get used to lots of things and might rarely show full-blown fear responses. However, when things are different, cattle can show some signs of anxiety, such as:

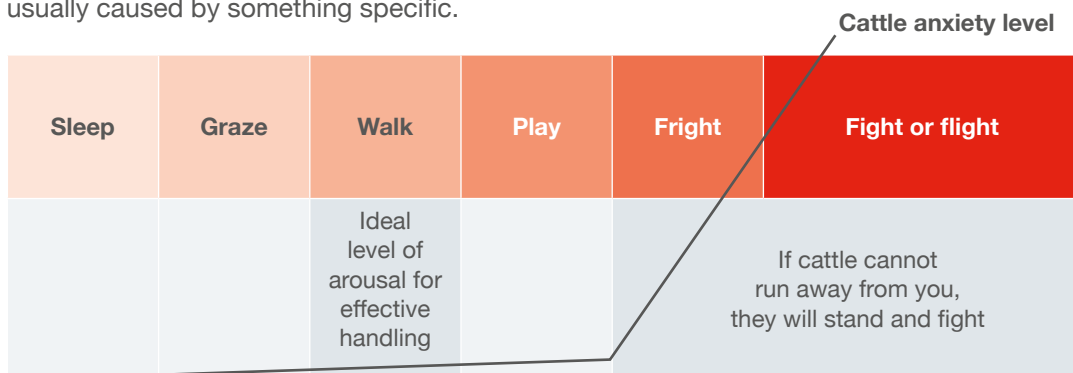
- Tail swishing
- Restlessness or increased responsiveness
- Increased vocalisations
- Raising the head up, on alert
- Locking ears to the problem
- Increased defecation

Top tip

Fear will produce fight, flight or freeze responses. Aim to move cattle at a walk. Control what you do to control what they do.

Keep watching the cattle and proactively look for the signs of anxiety.

For more information on cattle behaviour, watch our cattle handling webinars, available on the AHDB Beef & Lamb YouTube channel.



As the level of arousal raises, cattle anxiety increases

Crowd control

Other, less immediately obvious but instinctive behaviours can influence when and how cattle are best handled.

Behaviour	Handling tip
Cattle are diurnal, more active in the morning and evening.	Handle when more likely to cooperate. Try to avoid the middle of the day when they would naturally lie down and cud.
Cattle have a hierarchy within the herd: the lower-ranking animals stay out of the way of animals that are higher up the social order.	Lower-ranking cattle can be just as worried about the higher-ranking animals as they are about you. Give cattle space in the handling system so they can keep out of each other's way.
Dominance in the herd is related to reproductive fitness. Animals that are more dominant in the grazing situation tend to position themselves in the centre. When being driven, they are rarely first or last, but will be in the first third of the mob.	Dominant cattle influence the movement of the entire herd, positive or negatively, when being handled. Separating animals into smaller groups within the handling system reduces their influence.
Cattle with leadership characteristics (skills) are high ranking. They influence the herd, controlling aggression, finding food, affording protection and initiating movement.	Lead animals tend to be more curious and in a stable herd, can be used to your advantage. They are more 'trainable' and will not only follow feed and come to call, but bring the rest of the herd with them.
Sex and hormones influence behaviour. Sex hormones do not influence steers but they are constantly running in bulls. Heifers/cows' hormones are cyclical until in calf. In cows with calves, their natural protective instincts take over.	Think about which cattle you are handling and adapt accordingly.
Isolation – a single animal on its own is not a natural state for cattle.	Be extremely cautious when handling an animal on its own, or a straggler that has become temporarily separated from the herd. Keep and handle cattle within the sight and sound of others.

Learning

Cattle are, by nature, exploratory animals and given time and the right environment, they are quick to learn.

Learning occurs through several routes:

- Stimulus positive or negative
- Stimulus association
- Stimulus discrimination

Stimulus positive or negative

The simplest form of learning, this is where a stimulus always elicits the same response. On farm, cattle learn to come to the sound of a call or a bucket because it might mean food; likewise, they learn that electric fences are to be avoided.

Stimulus association

When there is a connection between stimuli, cattle learn to associate one with

the other. Cattle have a strong learning capacity for place association (knowing where things are). Places where animals are being handled could be seen as nasty, neutral or nice places.

Stimulus discrimination

Cattle can learn to tell one thing apart from another. In a farm situation, cattle can discriminate between familiar and unfamiliar handlers and familiar handlers in different clothes. Cattle can recognise people who have treated them positively or negatively in the past.

They also learn to associate people with places. Therefore, the vet at the crush often produces a different response than just you.



Stimulus negative – cattle learn to avoid electric fences



Top tips

- Balance the number of ‘nasty’ events in the handling system to ‘neutral’ or ‘nice’ ones
- If you can, give as few people as possible responsibility for ‘nasty’ procedures
- Cattle perceive people on or in a vehicle as a whole unit, so if you handle cattle on foot in the yards, they need to see you on foot in the fields

Regular weighing and handling is not only useful to monitor herd performance, but is also a good training aid to get cattle used to the handling system.

Mike Powley, a beef farmer from York, says, “I regularly weigh the growing cattle and after a couple of times walking through the system, the cattle flow nicely and calmly. Sometimes I open up all of the gates in the pens on exit of the crush, so cattle can have the full length of the system to run up and down and play. By doing this, the cattle associate the handling system with a positive experience.”

“ Sometimes I open up all of the gates in the pens on exit of the crush, so cattle can have the full length of the system to run up and down and play. ”

Mike Powley, beef farmer

To find out more about Mike’s system, see page 16.

Remember

Early handling experiences are important.

How cattle are handled after birth and after weaning affects their subsequent responses to handling. Early positive handling events produce calmer cattle. However, genetics also have an influence. Introduce cattle with ‘excitable’ genetics more gradually to new experiences than cattle with ‘calm’ genetics.

Animals: strategies for survival

Cattle have several instinctive behavioural patterns to avoid predators, such as herd formation, facing and flight zone, point of balance, milling and circling and splitting. Essentially, this is what cattle do when we handle them. If you learn to understand all of these patterns, you should be able to gather and drive almost any herd.

Herd formation

Living in a group improves the chance of individual survival. While some animals graze, others will be on the lookout.

Cattle alert each other with head movements. When under perceived threat, they come together for protection.

Cattle group together more tightly when in an area with predators; where cattle are free of predators, they will spread out. However, flighty breeds of cattle tend to bunch quickly when threatened.

Facing predators and the flight zone

Keeping a certain distance from a threat gives an animal a head start if it is chased.

The imaginary area around an animal is known as its 'personal space' or 'flight zone'. When a threat, such as a handler, moves into the animal's flight zone, it instinctively moves away, if possible, to maintain a safe distance from the threat.



The circle represents the flight zone

Once the threat is outside the animals' flight zone, they turn to face the potential threat because it can be seen more clearly. Often, the more dominant animals will be at the centre of the herd, while the subordinate animals will be around the edge.

The size of an animal's flight zone depends on the breed and the animal's past experiences. More docile breeds and cattle that have had positive handling experiences on farm (such as dairy cattle) tend to have a smaller flight zone than those that have been extensively reared with flighty genetics.

Cattle are sensitive to body posture: they can tell the difference between predators that are stalking and those that are just passing by. They respond to humans in the same way.

Handlers can increase or decrease the size of the flight zone and, to some extent, the response of the animals, by their posture and approach. Being quiet and calm reduces the flight zone; noise and movement increases the flight zone.

If handlers move too deeply and quickly into the animal's flight zone, the animal's reaction will be to run away, if it can escape. If the animal has nowhere to go, it will turn and attempt to run back past the handler.

Point of balance

The point of balance is at the animal's shoulder, running 90° from the spine. Movement behind the point of balance close to the animal will make it move forward. Movement in front of the point of balance close to the animal will make it turn and move away.

If a predator crosses the point of balance on the animal's shoulder, the animal will always run in the opposite direction. This instinctive movement helps the animal to avoid a potential attack (see Figure 1).

Milling and tight circling

With grazing animals, panic occurs when predators or handlers go into 'attack' mode. Dominant animals move to the centre of the circle and the weaker ones pace and mill at the outer edges, attempting to shove their heads to the middle of the group. It is frequently triggered when loading cattle, or when cattle are being forced into a race.

Milling cattle are frightened and stressed, likely to run or jump. When handling, ensure that this hard-wired response is not triggered.

If pressure is maintained, then the instinctive response is for one or two animals to split and run. The predator's attention is switched to the animal that has split from the rest of the herd is left.

Remember: cattle only respond to how we behave, so:

- Mimic the stalking predator, not an attacking one
- Use what you know about field of vision, flight zone and point of balance. Put yourself in the right place at the right time, every time
- Keep cattle heading in the same direction, but give them space and time; they should not be bumping or turning
- Never chase a straggler, allow them space to return to the herd

Step back

- Enter the flight zone to trigger movement, but step back out to prevent them moving too quickly
- Be careful if you encircle or confine the herd: they will not move if there is a threat in front of them. Watch for swishing tails and step back if cattle start to mill and circle

If cattle are handled like this, they quickly learn that moving in the right direction is rewarded with the handler moving out of the flight zone.

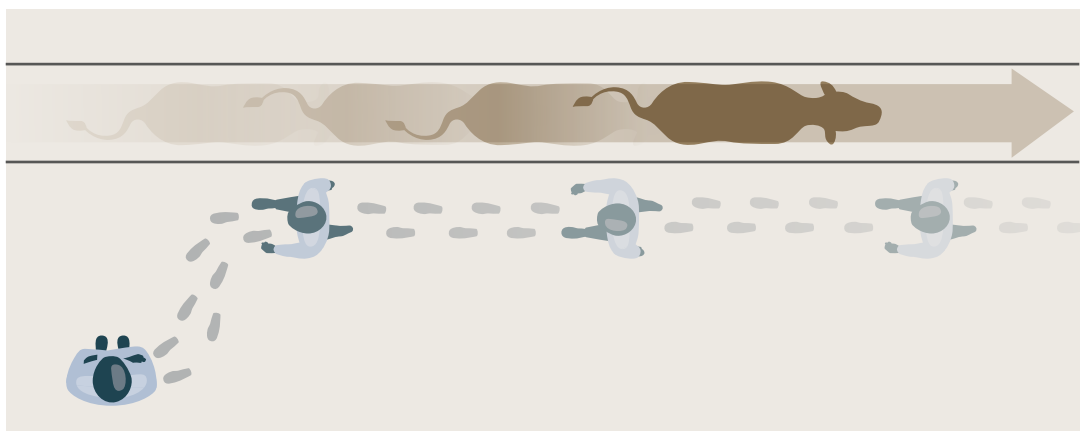


Figure 1. In a straight race, to keep cattle coming forward, walk close to the race in the opposite direction to which the cattle are moving, then move away

People

When moving animals, there is always risk. However, it is the people, not the animals, who can control that risk.

A good stockperson moves quietly and deliberately, with self-control. They keep their own arousal and activity level as low as possible, only increasing it when necessary and then only to a level that is effective without causing alarm. Give cattle time to acclimatise to new handlers; do not jump straight into the pen of unfamiliar animals.

The Health and Safety Executive (HSE) advises that while there is no upper age limit for handling cattle, children under the age of 13 should not normally be allowed to enter cattle housing or handle cattle. Many incidents involving cattle happen to people who are beyond normal retirement age, when they are less agile. Carefully consider the risks before allowing anyone over the age of 65 to work with cattle, and if so, consider what they can safely do.

All animals are different. Some groups of animals may require more persuasion to move than others. The level of force must only increase when the animal has failed to respond.

1. Look and listen

Body posture will communicate threat, submission and fear, while the sounds cattle make also communicate problems, including thirst and stress.

2. Keep calm

Do not allow past stress (with cattle or anyone else) to cloud the present.

3. Empathise

Take account of the animals' perspectives without losing sight of your aims.

4. Know yourself

Change your thinking to break bad habits. Know your physical limitations.

5. Avoid complacency

No matter how long you have worked with cattle, the unpredictable can always happen. Be prepared.

6. Follow your instincts

Sometimes you see danger signs without consciously registering them.

Handling aids

Handling aids, correctly used, encourage animals to move away from the handler in the direction required. They work in different ways:

- **Movement** into the animal's flight zone is all that is needed to get most animals to move away from you. They respond to the threat of you being close to them and instinctively move away to keep safe
- **Clapping, voice and rattles** are handling aids, which rely mainly on noise to stimulate animal movement. There may be an additional response because of the movement of your hands
- **Sticks** are used as an extension of the arm and cattle will respond to the movement of a stick

- **Hand slaps, slappers and pressure applied to the body** stimulate movement by contact with the animal. Contact or pressure should not be applied to any sensitive part of the body and only minimal force should be used. Using touch, a constant tapping when animals have nowhere to go puts the handler in the role of attacking predator – if the tail swishes, back off

An animal's instinctive response is to kick when touched. Keep out of the danger zones in the animal's blind spot.

- **Flags or a coat** can stimulate a forward response as animals respond to the movement of the flag



Flags are versatile and can be used in several different situations, but only by skilled handlers

Facilities: designing a new system

A new system is a big investment. Spend time considering the needs of your farm, such as the workforce, type of animals and the jobs you are going to do, to ensure that money is spent effectively.

Setting the priorities

Budget or time may limit what you can immediately achieve, so prioritise your plans.

- **‘Must have’** – matters that will make a big difference to you and your stock, particularly safety and stress
- **‘Should have’** – not vital, but making a considerable improvement to the efficiency of the system
- **‘Long term’** – not immediately essential, but an investment that will be a benefit when resources permit

Resources

This includes such things as people, space and money.

- How many people (maximum and minimum) will work the system?
- What are the skill/ability levels of your operators?
- How much space do you have available?
- How does the location relate to features such as field entrances, yard entrances, transport loading bays/ramps and cattle housing?
- What materials are on hand to utilise?

Operations

- How often will the facility be used?
- What will the facility be used for – weighing, veterinary treatment, testing?
- What vehicular access is needed for loading and unloading?
- How will it be cleaned, maintained?



Crush exit

Cattle

- What types of cattle will be handled – sex, size, age, weight, temperament?
- Do cattle ‘draw’ or flow better in certain directions than others?
- How many cattle may be handled at any one time?

Location – inside or out?

- If inside, consider lighting and ventilation
- If outside, consider the effects of prevailing winds and the position of the sun
- What is the relationship to field, yard and housing entrances?

Futureproofing

Handling facilities are long-term investments, so make sure any changes or new builds take account of your ambitions for the next 5–10 years.



Case study: Developing a system to manage 100 suckler cows as a one-man band

Mike Powley, York

Mike Powley farms 144 hectares, running 100 spring-calving suckler cows and 60 hectares of cereals.

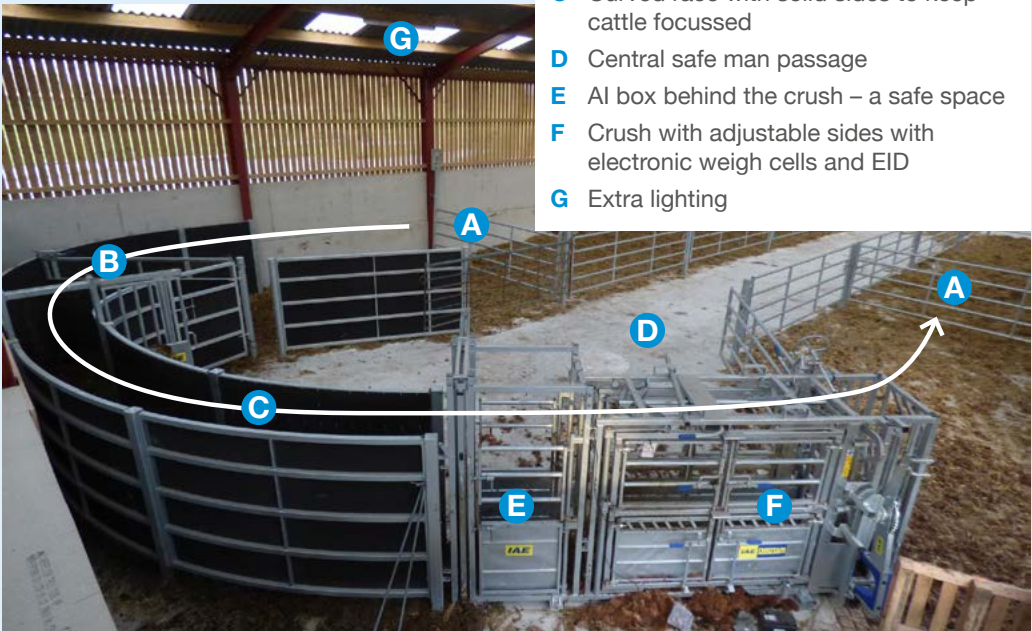
Before building the new farmstead, cattle were housed in traditional buildings across three different sites. In the winter, managing cattle across the three sites could take 6–7 hours per day, transporting the crush and gates, feed and straw. A handling system on one of the farms was made from sleepers concreted into the ground, so its use was limited. Mike says, “We decided to build a new farmstead, so needed a new handling system. My father was getting older, so I needed a system in which I could safely manage 100–150 cows on my own and that was large enough to carry suckler cows and calves and finishing cattle on one farm.”

Planning

Over the years, through the AHDB Strategic Farm Programme, Mike has visited plenty of systems on different farms to get ideas. The Powley’s wanted a system that was safe to use as a lone worker, easy to clean and that could be used for all tasks on farm, such as weighing and monitoring growth rates, artificial insemination (AI), pregnancy diagnosis (PD) and calving. If the cows are in several grazing groups, the system needed to be large enough to handle the sucklers at the same time and have enough pens to keep the groups separate.

The new design

- A** Holding areas with gates that fold to create 14 calving pens
- B** The curved sides of the crowd pen stops animals’ from hanging in corners
- C** Curved race with solid sides to keep cattle focussed
- D** Central safe man passage
- E** AI box behind the crush – a safe space
- F** Crush with adjustable sides with electronic weigh cells and EID
- G** Extra lighting



Mike says, “We drew out hundreds of different options and came back to our original idea. We then had the system built using our own design and specification.”

The new handling system is housed under a 150 x 45 ft shed and was designed using Temple Grandin’s principles.

The curved sides of the crowd pen stops cattle from hanging in the corners, while the solid sides focus the cattle on where they need to go. The cattle can be handled safely and Mike doesn’t need to get in the pen with them.



The Powley’s installed twice as many roof lights as advised and have extra lighting over the crush, which Mike says is “brighter than daylight” when using the system for calving at night.

Mike says, “My biggest recommendation to anybody building a new handling system is to make sure you have plenty

of pens before and after the crush – they are great for shedding and dividing groups of cattle. It’s not wasted space – our pens can be used as calving pens and to handle several different groups of cattle at once to get a routine task done.

“On my own I can weigh 120 cattle or PD 96 cows with the vet in one hour. This is with calm cattle walking through the system, no shouting or banging about”.

The crush

Cattle are automatically weighed as they go through the crush and the digital screen allows Mike to look at individual animal records and daily liveweight gains. Mike says, “The squeeze crush works really well to keep cattle calm – even 200–300 kg calves run through the system fairly well without pushing and shoving and can be held securely in the crush. Our system is unique in that all sucklers are artificially inseminated, so we have an AI box behind the crush to safely serve cows. We also accurately worm the cattle over the scales, bolus them using the head scoop and clip them all at housing. The system is set up so we can access the crush at any side or angle and be safe. The crush is positioned so that cattle are going back towards where they came in, which they instinctively prefer, so this aids the flow through the system.

“ Compared with all of the equipment on the farm, this is the best investment we’ve made. It has revolutionised what we do ”

Mike Powley

Facilities: Improving an existing system

Most farms are limited by space or capital and building a system from new is not a viable option.

Top tips

- Simply spend some time standing back and watching animals go through your system
- Note where animals move freely forwards and where they stop. On a sketch of your yard, you could mark in red where they stop and green where they move. Simple changes can be very effective and not too costly
- Look around the farm and see what materials you've got which can be reused to upgrade the handling system



Case study: Updating a system for lower cost

Elizabeth Jervis, Staffordshire

Elizabeth Jervis runs a mixed arable and beef farm, with stock kept through to finishing.

The farm has two handling systems, a new system at one holding for the suckler herd and an older system at another holding to handle the finishing cattle. This handling system is only used in the winter months when cattle are housed, so it made financial sense for Elizabeth to upgrade rather than invest in a brand new system. Before upgrading, the farm had a temporary set-up using gates and a crush alongside the housing. Elizabeth says, "Cattle flow was very poor and we had to get in the race with the cattle to move them through the

system. It wasn't particularly safe and each time we had to handle the cattle it seemed a chore."

"We wanted something safe, fit for purpose and on a budget. We started researching and put some ideas together. After attending a cattle-handling event, I realised we needed to design a system around the cattle and the maximum number that we would need to handle – up to 150 cattle."

Elizabeth arranged a visit from a cattle handling consultant, which allowed the system to be assessed from a different perspective, focussing on designing a system around the cattle's' instincts and flow through the system.

Key alterations using the new design:

- Alter race to be longer and narrower
- Added solid sides using concrete panels, gates and stock boarding
- 30 degree angled entrance into the race
- Repositioned race and crush

Once a design had been chosen, Elizabeth and the consultant discussed how to upgrade the system using existing materials on farm. Spare gates and stock boarding were used to extend the race and create solid sides – a relatively cheap and very effective fix to focus the cattle and improve flow.



Cattle race using materials found on farm with new crush repositioned to face fields

Elizabeth says “The race and crush were repositioned to face fields to encourage cattle to walk through as they could see an exit ahead and as a result cattle flow has greatly improved. The holding pen has a sandy floor and the cattle feel very secure on it. To increase footing in the race, the concrete was done with a carbon sprinkle finish.” Elizabeth plans

to upgrade the backing gate at the crush and cover with stock boarding to further improve the system.



Race with 30 degree angled entrance and solid sides

“ Getting a second opinion before making changes to the system was really beneficial. I now view handling from a different angle, people and cattle are much calmer. ”

For more information on improving an existing system, watch our series of cattle handling webinars, available on the AHDB Beef & Lamb YouTube channel.

Facilities: the big picture

Every farm needs a system that is safe, simple, efficient and effective to operate so that handling is a positive event for both handlers and cattle. Cattle (and humans!) move because they are being 'pushed' or 'pulled'. The push comes from fear: cattle will naturally move away from something that they are unhappy with, and in the handling situation, this is usually people. The pull is because they are attracted to something (for example, an open gate, or a way out) and is because, left to their own devices, cattle are naturally curious. A well-designed system pulls cattle through and some very basic things are required to get it right.

Site and layout

The site should be as level as possible. Since cattle's centre of gravity is at the shoulder, they don't find it easy to go downhill and move better on the level or on a slight uphill gradient. Cattle don't like tight turns or corners, so cramped systems are rarely efficient. Circular and curved systems are better, but only if there is enough space to stick to the minimum recommended dimensions.



Orientation

Cattle will naturally 'draw' better in one particular direction, so the layout of the system should exploit this. Turning them round by 180° works because cattle

instinctively want to go back to where they came from (bounce back). Ideally, the crush exit should not be directly towards low sun in the early morning or late evening. Cattle move better when the exit is back towards the home pens or fields. An example of this system can be found on page 16.

Do cattle move better left-handed (anti-clockwise)?

Cattle use both eyes to take in information. However, information from the left eye is processed in the right brain and information in the right eye is processed in the left brain. The right side of the brain processes images, objects, shapes as well as behavioral responses relating to fight or flight. In response to something unfamiliar, such as a handler, cattle show a preference to put the handler on the left.

Lighting

Good lighting, whether natural or artificial, is important, especially in the main work area. Cattle dislike moving into dark areas, so never place the roof of a building over a critical part of the system such as the entrance to the crush or a junction between the holding pen and the race. With facilities outside, on a bright day be aware of shadows and contrasts that can affect cattle movement.



Floors

Cattle have an instinctive fear of falling. All floors must be non-slip for both cattle and humans, whatever the weather. Floors must also be uniform. Get rid of drain covers, steps, puddles and other distractions on the floor because cattle tend to stop and look at them.

Case study

Mike Powley, York

Mike Powley says, “Our floor features heavily scored concrete throughout, including at the crush exit, so cattle don’t slip if they exit the crush with excitement.”



To read Mike’s case study see page 16.

Security and safety

Make sure that the system is secure and well-constructed and maintained. Keep cattle and people separate whenever possible and if people need to be in with cattle, always check that there are suitable escape points or refuges.



Any time you are working with cattle, make sure you can get out of the way quickly – over, under, through?

The standard cattle handling system can be split into the ‘big five’ elements:

1. Holding area
2. Crowd pens
3. Races
4. Crushes
5. Exit and sort

1. Holding areas

Cattle need space in the holding areas so they can get out of the way of herd mates. Overcrowding will trigger milling and circling behaviours and raise anxiety.

Allow a minimum of 0.9–1.4 m² per head for beef cattle, 1.7 m² per head for adult cattle and 1.85 m² per cow and calf pair (3 months).

Rails must be at a minimum height of 1.5 m; however, it is good practice to go to a top rail that is higher than the biggest animal to be handled in the head up position – this might be 2 m when dealing with big continental cattle.

Long, narrow runs of pens are easier to operate – a width of 10–12 ft. can be managed by a person on foot.

Some cattle being held might begin to feel anxious if surrounded by solid sides, so holding areas can be more open.

Holding areas are not necessarily space wasters:

- Make them dual-purpose for holding cattle
- Make gates to fold back
- Design buildings so that accommodation can feed into the system

Solid sides

People and movements outside of the handling area can distract cattle. Use solid sides at key points in the system, such as close to the crush and in the crowd pen, to block out distractions and focus cattle on where they need to go. In solid-sided crowd pens, work outside the pen and, incorporate a safe refuge or escape gate.

2. Crowd pens

Cattle are potentially under more pressure in the crowd pen. With poor design, cattle will resort to instinct to mill, circle, turn back and attempt to escape.

The key to good design is making sure cattle can see into the race – and that remains the best option.

Whatever the shape of the crowd pen, never pack the animals in too tightly. Cattle need plenty of room to turn and follow one another up the raceway. Match the crowd pen size with the raceway length.



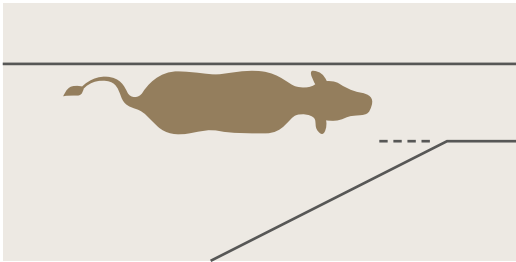
Give cattle plenty of space in the crowd pen

Circular crowd pens work because cattle cannot hang into any corners; however, they must have a minimum 3 m radius.

Top tip

A square or rectangular pen can be made to work more efficiently by putting boards across the corners or creating a refuge point.

Getting the correct angle from the crowd pen into the race is critical. There should be one straight side from the crowd pen and the other side set at an angle of 30°.



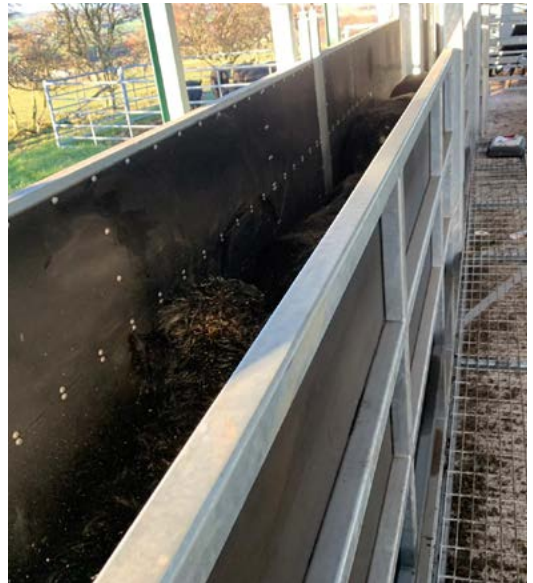
This reduces the chance of cattle standing across the race entrance and means that cattle at the race entrance can see up the race. Ideally, there should be two cattle lengths before any turn, bend, crush or gate in the race.

3. Races

Races should be designed to suit the jobs that you need to do on the farm. Allow about 1.5–2 m per adult animal in the race.

Heart rate rises when animals are kept standing in single file for around eight minutes. If you do a lot of sorting and weighing, animals are kept moving so longer races work. If you are clipping or doing jobs that take more time, shorter races and less standing time will be better.

When you put a curve or bend in the race, make sure that the handler position is on the inside of the curve. This helps to exploit the natural behaviour of the cattle to circle around the handler. It can also save walking. Ideally, have the handler moving cattle left, i.e. anti-clockwise, around the handler.



Case study

Elizabeth Jervis, Staffordshire

Elizabeth says, “The race and crush were repositioned to face fields to encourage cattle to walk through as they could see an exit ahead and as a result cattle flow has greatly improved.”

To read Elizabeth’s case study, see page 18.

Throughout the system, make sure there are no tight, right-angled turns, or tight turns within a curved race. Remember cattle have to turn like a rigid long vehicle, so they need plenty of space and to be able to see the way out.

Facilities: crushes

There is a huge variety of equipment available to suit all jobs, cattle and budgets. Look out for key design features that can greatly affect their suitability.

Length

The cattle need space to walk freely into the box before they are restrained. The box needs to be long enough for the cattle to want to move into it. If you have large cattle, they will need a body length (1.8–2 m) plus about 0.75 m from the front gate to allow for the animals' poor depth perception.

Width

Where youngstock need restraint, sides should ideally be adjustable. Squeeze crushes are highly adaptable and are a good investment if you frequently handle cattle of varying sizes.

Height

The sides of the crush must be sufficiently high to discourage animals from jumping. Many are already fitted with overhead bars to add strength to the structure. However, animals might be wary if the space feels too enclosed or, if the frame is at eye level when they approach, it may block the line of sight to the exit.

Strength and stability

The larger squeeze-type crushes can weigh 800 kg or more, whereas the cheaper, more mobile units are below 500 kg.

Crushes must be firmly secured.

Floor

The floor must be sound and stable for the animal to stand on. Cattle should be able to maintain balance without restraint. If they have poor footing, they will become anxious.

Front section

Self-catching devices are most suitable for polled, quiet cattle of similar sizes.

Other systems rely on the operator to catch the head. They may have an opening design, or use a scissor action – both are suitable for general-purpose use and mixed cattle sizes.

The gates can be fitted with additional devices to help position the head. A neck bar or rope goes over the poll to push the head down, whereas a chin bar lifts the chin up. Head scoops provide greater control and can be retrofitted to existing crushes (see Figure 2).

Modern crushes have head gate controls, both at the front and the rear of the crush. When working on your own, you can be behind the cattle and move them ahead of you into the crush using the animal's point of balance.

Side section

The sides can be fixed or fully adjustable, moved manually or by hydraulic systems (squeeze crushes). Squeeze crushes effectively 'hug' the animal, applying even pressure along the body to reduce the likelihood of animals fighting, compared with being held solely by the head or neck (see Figure 3).

Rear section

To prevent backward movement of the animal, a rump bar can be inserted behind them. It is vital that the design allows the bars to be held in place, in case the animal struggles or kicks back. Rear vet gates allow full access from behind. Slide-in or roll-over gates at the rear of the crush are operated from outside the race or crush, so are – in general – safer.



Figure 2. Head scoop



Figure 3. Air-operated crush with fully adjustable sides

Handling

Most cattle do not like to be restrained, so can become stressed and agitated in the crush owing to deep invasion of the flight zone, people standing close by and the restraint itself. If the restraint process is aversive, then transit time will increase the next time the cattle go through the race. It's a downward spiral. See handling tips on page 26.

Observe the cattle. If a high percentage of cattle vocalise, slip, fall, or exhibit some other non-effective behaviour (e.g., attempts to turn, jump, or stop), then check to see what might be causing this.

Top tips for handling

Here are some basic rules to minimise stress when restraining.

Start calm and handle cattle quietly to the crush – if cattle are already wound up, restraint will be more difficult and stressful. Make sure cattle are settled – after yarding, they must approach slowly and should walk or trot through the crush.

Cattle must willingly enter the restraint. What does it look like to the cattle? Is it light and inviting? Can cattle see a clear way to go? Block vision to any escape route, but allow animals entering the crush to see a lighted area ahead.

Solid sides work, especially on approach to the crush. If the sides are open, cattle may feel threatened by people working close to them. This is most important with more nervous, fearful or excitable cattle.

No pinch-points – they will cause pain and the animal is likely to fight against them. Crushes don't mould around the animal's shape. Check to make sure there are no uncomfortable points on the animal during restraint – these may lead to pain

and bruising and make cattle more resistant to being restrained in the future.

Good footing helps cattle to feel more secure. Remember: cattle have an instinctive fear of falling. They are less likely to stand still or stay quiet on slippery or unstable floors.

Noise from the crush should be minimal. Where would a rubber stop or a small amount of lubrication help?

Maintain balance – the crush should support or hold the animal in a balanced position. If the animal loses balance or feels unstable, it will become fearful and begin to struggle to regain control.

To help prevent cattle lunging at the head gate, position the gate about 120–130 cm from the catching yoke.

A slow, steady motion of all restraint devices will keep cattle calmer, whereas sudden, jerky movements will cause panic. Check and maintain moving parts.

Use optimal pressure. Too much may cause pain, discomfort or even injury. However, if a restraint is loose, cattle will try to escape and there is a risk of injury to cattle and handlers.

Exit strategies

When cattle exit the crush, they must be moved away from the handling area. Efficient systems have as much penning and sorting space after the crush as they do behind it.

Safety requirement

Animals should not be able to enter the area either side of the crush where operators are located.

Loading and unloading

Loading and unloading cattle needs careful consideration so that it can be done safely and efficiently.

Loading facilities can be incorporated into the main handling facility, or be a separate facility. Ideally, locate a loading facility on the perimeter of the site to maintain biosecurity.

Sites must allow access for the vehicles used now or in the future.

Loading

- Make use of a natural slope to minimise the gradient
- Build a ramp to bring animals up to the right level
- Cut into the ground
- Make use of an existing facility – for example, load off the round pen
- Consider single file loading from the main race or crush
- Safety – solid sides help direct animals into the vehicle, but the handler must be able to find a safe space, should the animals turn
- Ensure you are safe around any moving vehicle

Unloading

- Before you drop the tailgate, ensure pens are ready and there is a clear way forward
- Release animals, stand clear and stay in a safe place
- Usually easier – as long as cattle are given a bit of time



Facility designed for single file loading



Purpose built loading and unloading dock



Purpose built loading ramp

Relevant resources

Video

An introduction to Cattle handling systems

Webinars

Cattle handling webinar series

For more information, see Health and Safety Executive (HSE) advice on handling and housing cattle, available at [hse.gov.uk](https://www.hse.gov.uk)

See the AHDB website [ahdb.org.uk](https://www.ahdb.org.uk) for the full list of Better Returns Programme publications for beef and sheep farmers.

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