

Cow tracks and herding



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Introduction

Cow tracks bring a number of benefits to your farm and herd. Installing a track can save money, keep your cows healthy and minimise your environmental impact.

The right track can:

- Improve cow flow and reduce herding time
- Allow cows to travel comfortably and easily over considerable distances from the parlour
- Minimise damage to claws and reduce the risk of skin lesions (e.g. foul), which also minimises lameness
- Reduce field poaching and compaction, which lessens environmental impact
- Extend the grazing season by providing better field access
- Improve udder hygiene by keeping cows cleaner

Cow behaviour

When installing a cow track, it's important to keep in mind the way cows behave when they move around in groups. You'll also need to make sure that the track is wide enough to accommodate your herd size (see Table 1). You may wish to make your track wider if you plan to expand your herd.

Cows walk and stand with their heads down

Given space for their heads to move up and down freely, cows will find safe foot placement, allowing them to avoid cows of a higher dominance and respond to pain if they stand on a stone. If cows' heads are up, either on the track or in the shed, it is because they are too tightly packed.

Action: Give your cows space – don't force cows to bunch up tightly on the track or in the milking shed.

Cows have a pecking order

Cows have a walking order that is slightly different to their milking order. After entering the collecting yard, cows need time to rearrange themselves before they enter the parlour.

Action: Give your cows space and time to rearrange their position in the herd before entering the parlour.



Dominant cows set the walking speed of the herd

Pressure on the cows at the rear on the track or by the backing gate causes the rear group to compact because they won't overtake the dominant cows in front of them. The front cows are almost unaffected and so don't walk any faster – they continue at their own speed.

Action: Don't put pressure on cows at the rear of the herd.

Cows follow the leaders – their movement is forward

Under pressure, lower-dominance cows and heifers reverse out of tight spots, so a cow reversing indicates too much pressure.

Action: Increase the distance between the herdsman and the herd on the track.

Number of cows in the herd	Minimum width of surfaced track (m)
200	4
300	5
400	6
500	7

Table 1. Minimum width of surfaced track required per number of cows

Note: Always allow for any expansion plans you may have for the herd – it is easier to increase the number of cows than to increase the width of the track.

Position of tracks

When deciding on a route for your new cow track, there are a number of things to keep in mind.

Position of track

Before deciding on the route for your new cow track, consider the layout of your farm. Start with a farm map and plan the ideal position of tracks, which may then be installed over a few years.

Service areas

Does the track need to service all areas of the farm? Take cropping patterns into consideration to maximise the use of the track.

Track dimensions

A 5 m track of which 4 m is surfaced will enable good flow for up to 200 cows. Each additional 100 cows would require an extra 1 m width (see Table 1).

Track locations

Tracks should, if possible, not be in hollows as surfaces will require more maintenance. Avoid tracks in heavy shade if possible (i.e. a south-facing side of a hedge is better where there is a choice).

Land gradient and surface type

Is the proposed track on flat land or a slope? The gradient may determine the type of surface used. On sloping land, follow contours wherever possible. The maximum gradient for a track with a loose surface can be up to 12% but ideally no more than 8%. See Slopes and steps (page 8).

Track design

The track should be designed and planned to run the shortest route from A to B to save materials (in some cases, this may be directly through the field). Distance walked per day must be factored in – the greater the distance, the more energy used and the less available for milk production



Fence siting

Siting of fences alongside the tracks needs to allow cows to use the full width of the track. Tracks should not have sharp turns or narrow areas as this may cause bottlenecks.

Environmental and regulatory considerations

If the track is to run near a river, seek advice from the Environment Agency (EA)/SEPA. EA/SEPA must be consulted for works in, over, under or adjacent to rivers. Check with the landowner and/or local authority about planning issues relating to the construction of tracks, as materials used may affect the permissions needed.

New tracks should avoid areas of wildlife interest and sites of archaeological or historic importance. Check if any consents are needed. EA or Internal Drainage Board (IDB) consent may be required for any track sited adjacent to a watercourse; maintain a suitable buffer between the track and any watercourse.

Ideally, visit several different farms with cow tracks to see how they are working in practice and how they could be modified for use on your farm.

Track materials

Surface materials

In terms of surfaces, there are several options to be considered. These include solid surfaces, such as concrete or concrete railway sleepers, through to softer surfaces, such as woodchip, sand, limestone dust and numerous commercial named products. It may be possible to use either an on-farm supply of stone or waste building rubble in the base of the track.

Potential surface materials include:

- Oolitic limestone laid with a vibrating roller in 2-inch layers (following wet weather to aid compaction)
- Sandstone
- Chalk to which sand may be added to reduce the risk of cows slipping
- Crushed stone or rubble commercial crushers can be contracted in. The stone can be stabilised with cement if required
- Woodchip
- Stone dust

Cows walk better on softer surfaces, but consider the following:

- The gradient of the track
- Weather conditions
- Disposal if no longer required
- Tracks should be for cows only
- If using sleepers, they should be placed directly onto topsoil rather than digging into a trench, and there is no need for a crossfall on the track
- The use of a geotextile membrane to create a barrier between the topsoil and the track material should prevent large stones and mud from rising to the surface. This will increase the life of the track

 Don't use material of a size and shape that can be trapped between the claws

 any bought-in materials should be screened for metal, which can puncture and damage soles

Waste and permissions

The classification of some of these materials as 'waste' may have a bearing on the permissions needed for use.

Please contact the EA, SEPA or NRW before building your tracks to apply for the relevant waste exemption licence. For most cases, it will be U1 – Use of waste in construction.

Example activities for a U1 waste exemption licence include using:

- Crushed bricks, concrete, rocks and aggregate
- Road planning and rubble to build a track, road or car park

For further information, see gov.uk/guidance/u1-waste-exemption-use-of-waste-in-construction

Design and build

To give your new cow track the best chance of success, there are a few things to keep in mind when designing and building it. Work through our list of considerations to make sure you're constructing an effective and long-lasting track.

Topsoil: Unlike for machinery tracks, there's no need to strip off topsoil before laying a new cow track. However, topsoil should be stable and compacted and areas which are prone to being water-logged should be avoided.

Material: The stretch that leads to the parlour should be wider and preferably made of concrete. A kerb can be added where the two materials join to reduce the potential transfer of stones from the track onto the concrete, which, in turn, decreases the chance of sole damage.

Depth: Tracks sink over time, so it's important to build them up well at the start.

Compaction: Build the body of the track in 150 mm layers and use a method of compaction that will increase track durability and lifespan, such as a vibrating roller.

Camber: The camber should be 3–6% (maximum 10%), free-draining and exposed to the wind and sun for quick drying.

Figure 1 shows the cross-section of a track using the proud crown design.

Getting the camber correct is really important. A common mistake is to over-camber the track which results in cows only walking along the crown of the track.

Fencing: Place fences so that they won't interfere with maintenance tasks or affect cows walking along the edge of the track.

Ditches: Make edges steep in ditches to stop verges forming. Where ditches are positioned alongside the track, additional wire can be used to ensure that cows stay on the track and avoid the ditches (Figure 1).

Drainage: If necessary, construct cross drains to carry run-off into existing drains on the edge of the track. Ensure this is diverted off the track and not onto lower areas of the track or into watercourses. Where the track is located across a slope, natural drainage can be achieved with a 5% fall across the width of the track.

Slope: Installing cross drains or sleeping policemen is essential on sloping tracks where run-off is an issue or where a track leads onto a highway. You can also link drains with a sediment trap to prevent excess run-off from contributing to localised flooding.



Figure 1. A track using the proud crown design. A 3-6% camber is appropriate for a track that is 4 or more metres wide

Slopes and steps

Slopes

- Cows are generally content to go up or down gentle slopes, of up to around 10% incline/decline
- Going up slopes is easier for them than going down

Problems

Slopes can be hazardous for several reasons:

- They slow cow flow, leading to bottlenecks
- They can become slippery, leading to injuries and cows falling over
- They can become congested, leading to stress and injuries to the cows
- Slower cow flow may lead to frustration of the stockperson who may be tempted to put greater pressure on the herd in a futile attempt to speed up the cows

Solutions

- Ensure slopes have plenty of grip
- Where the slope is a short section, provide extra width at this point (see Figure 2)



Figure 2. Widening of a track using additional sleepers at the edge, where there is a short slope towards the main yard, and which could be a congestion point

- It is not unusual to have a slope up into a milking parlour – install a rubber floor, especially close to the parlour entrance, to provide extra walking confidence and help cow flow
- Ensure that cows are able to travel at their own speed, and accept they will be slower on slopes

Steps

- Cows prefer steps to slopes
- Cows will speed up if a slope is converted to steps, and there will be fewer injuries
- Steps should ideally be used wherever the incline is more than 15%, but they are very useful even on shallow inclines
- Cows prefer shallow rises (around 100 mm or 4 inches) on the steps wherever possible (Figure 3)



Figure 3. A small section of steps between a main track and the raised collection yard

Designing steps

- The ideal steps have a shallow rise and a long tread length (see Figure 4)
- The ideal tread length would be the length of a cow, so around 1,600 mm
- The ideal step rise would be as low as possible, around 100 mm or 4 inches, especially for going down (cows are better going up than down)



Figure 4. Ideally the rise is small and the tread length is long. Steps with a 100 mm rise and a 1,600 mm length would be the most cow friendly but only result in a 6.25% incline. For steeper inclines, compromise on the tread length before the rise height

- A rise of up to around 15 mm or 6 inches is acceptable as a maximum
- Where you need to compromise, always shorten the tread length over the rise height. For example, a very steep incline (20%) can be achieved with a 100 mm rise and a 500 mm tread length (Figure 5)
- A suggested absolute minimum tread length is 300 mm, and this would allow

lots of lower (100 mm) steps for a steep incline of up to 33%, which is unlikely to be required in all but exceptional circumstances

- Make the step lengths even in size
- Make the rise a hard square edge (not rounded) – cows will see this better
- Always make the steps level do not be tempted to put a slope on the step



Figure 5. A steep incline (20%) managed with steps of 100 mm rise and 500 mm length

Top tip

Measure your total rise. Divide by 100 mm – this will give you your total number of steps required. Divide the total distance by this, and you find the length for each step.

Underpasses and overpasses

- An underpass can be a useful way of crossing a highway or farm road (Figure 6)
- An underpass/overpass arrangement is a better way to design cow tracks where two tracks must cross each other for the purposes of cow flow. This is because the total slope height can be divided by the two passes (Figure 7)



Figure 6. An underpass utilising steps



Figure 7. An underpass/overpass arrangement where two cow tracks cross each other. Here, by dividing the total incline/decline between the two tracks, all of the slopes can have a reduced gradient

Renovating and maintaining cow tracks

Spotting problems with your track

A track is as good as its performance on its worst day in the worst section. Good management of your track is key to its long-term success. Here are the warning signs to look out for that may indicate a problem with your track:

- High or rising lameness during grazing period
- High levels of sole bruising, foul in the foot, white line disease or sole damage that can be linked to stone damage during track usage
- Ridges and gullies forming on the track provide evidence of water run-off and erosion
- Bottlenecks in cow flow during herding
- · Cows raising their heads during herding
- Cows jostling for position and therefore pushing against others in the herd
- Excessive dunging in certain areas of the track
- Cows tending to walk along the verges or in single file
- Cows walking slower than 3 miles per hour on the track

If you notice any of these signs, it may be time to carry out some maintenance on your track.

Maintaining your cow track

Maintenance of tracks is crucial for them to perform as expected in terms of cow flow and cow comfort. Here are some considerations:

- Top or cap the surface with fine stone or a soft organic material. Mechanically crushed stone is a good replacement surface
- Always compact the new surface with a heavy vibrating roller to remove rough edges and build the required camber into the surface. A specialist machine to do this is available; this consists of a heavy-duty rotavator, followed by a machine to build the camber or appropriate fall across the track. This should then be followed by a heavy vibrating roller which needs to generate 70 tonnes of force
- If the original track is made from woodchips, ensure it's properly drained and has suitable fencing along the sides to prevent soil contamination
- Identify problem areas such as gateways and look at options such as rotating the field entrances and exits, or making openings wider

Drainage

To prevent your cow track surface from deteriorating, it is critical to ensure it is adequately drained, which stops pools from forming.

The position, camber and drainage of your track are essential for reducing run-off and stopping your tracks from sending that run-off into a watercourse.

When planning drainage for your new track, remember:

- For tracks less than 4 m wide, you'll need a crossfall of 150 mm. For wider tracks, you'll need a camber between 3–6%
- Keep the camber convex to shed water along the whole track rather than in one or two areas
- If necessary, construct cross drains to carry run-off into existing drains on the edge of the track. Ensure this run-off is diverted off the track and not into watercourses

- Clean cross drains regularly to ensure they continue to divert water off the track
- Don't allow water to run along the tracks nor remain on the surface – standing puddles tend to erode and, in time, destroy the surface of the track
- Verges along tracks will build up over time. Remove these each year to ensure the free movement of water off the track
- To prolong the life of the track, consider clearing overhanging greenery and ditches, which minimises weather damage and improves sun and wind exposure, allowing the track to dry more quickly

Costing out a new track



When looking into tracks, a true costing of materials should be carried out.

 Do your calculations based on the quantities of materials you'll need to get your desired width, depth and length of track. This allows a 'true' costing of the different materials to be done. A 'cheap' load of materials may turn into an expensive track if you don't consider the quantity and maintenance regime of the track from the outset As a rule of thumb, a m² of track would need a tonne of material.

- If you're using chalk, sand, rubble or shale, make sure you get a quote for the correct grade of material, as it can vary
- Remember to factor in transport, labour and machinery costs
- Don't forget to include the cost of the fencing alongside the track

Fencing a track



When planning a new cow track, you will need to think about what fencing you'll build alongside it.

- Make sure you have plenty of entry and exit points to all your paddocks so that cows can use different openings on their way in and out
- Use temporary fencing, such as coil springs with insulated handles, to allow for more entrances and exits than you'd have if you used gates
- Keep water troughs away from the track to avoid track surface damage and stop cows from slowing down

Electric fencing

Single-strand, high-tensile electrified wire fencing should be sufficient to keep stock secure, provided the electric current running through it is maintained.

While building the track, lay plastic pipe to act as ducting under gateways so that your fences can be electrified from a single point.

If you're grazing young livestock, add a second electrified wire lower on the posts.

Healthy Feet Programme

The AHDB Healthy Feet Programme is a structured approach to help dairy farmers make important progress towards diagnosing the problems causing lameness, devising an action plan and developing the skills necessary for long-term lameness control.

The approach is based around four success factors for healthy feet that reduce lameness:

- Low infection pressure
- A robust foot good horn quality, hoof shape and nutrition
- Low forces on the feet good cow comfort and cow flow
- Early detection and prompt, effective treatment of lame cows

Every herd has different lesion patterns. Once you know yours, you can use the four factors to develop a programme to improve herd mobility.

To find out more, visit ahdb.org.uk/healthy-feet

The AHDB Dairy Healthy Feet Programme looks at the effectiveness of cow tracks and the way the herd uses them as part of the on-farm assessment.

To find out more about the programme, please see cattlelameness.org.uk or ahdb.org.uk



Further information

- Scottish Environment Protection Agency (sepa.org.uk)
- NetRegs (netregs.org.uk)
- Association of Drainage Authorities (ada. org.uk/member_type/idbs)
- Natural Resources Wales (naturalresourceswales.gov.uk)
- Register, renew or change waste exemptions guidance (gov.uk/guidance/register-your-wasteexemptions-environmental-permits)
- Environment Agency Agricultural Waste Helpline: 0845 603 3113

Other publications from AHDB

- Mobility scorecard
- Hoof care field guide

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