Out-wintering Cattle Successfully
Summary

Out-wintering cattle can be a very effective way to reduce their costs of production, including feed and bedding. It is particularly suitable for dry, spring calving suckler cows in good body condition which have a relatively low nutritional requirement and may also be suitable for other classes of cattle such as replacement heifers or store cattle.

A variety of out-wintering systems are practised, from feeding a normal silage based diet outdoors, deferred hill grazing or on forage crops. It is critical that the welfare needs of the cattle are considered in all systems but this is even more important when they are not housed. Adequate shelter from wind and rain must be provided to alleviate the effects of wind chill and a dry lying area is essential for cow comfort.

If these requirements cannot be met then out-wintering is not appropriate and the extra feed required to alleviate these welfare issues will offset the financial benefits of the system. In addition to the animal welfare and performance issues it is crucial that environmental issues are considered to ensure that soil erosion and nutrient run-off does not occur.

Introduction

Studies over several years have demonstrated the benefits that can be obtained from out-wintering cattle. There are obvious reductions in housing and bedding costs and there are also benefits in the health of the cattle. These benefits can be obtained without a substantial increase in the costs of feeding when the appropriate forage crop and conserved fodder are used, to ensure that target production is met.

Therefore the success of out-wintering depends on providing appropriate conditions and nutrition so stock target performance is met without compromising their welfare.

The major challenges to welfare in this system are the cattle being cold and wet due to the effects of inclement weather conditions, and lying deprivation arising from the lack of a dry lying area. The Welfare of Farmed Animals Regulations requires that:

‘Animals not kept in buildings shall, where necessary and possible, be given protection from adverse weather conditions, predators and risks to their health and shall, at all times, have access to a well-drained lying area.’

Out-wintered cattle should also be fully ruminating and be over 200kg in liveweight before being considered for out-wintering systems.
Avoiding the effects of cold

The thermal comfort of any animal is the balance between the heat it produces and the heat it loses to the environment. During the process of digesting and utilising feed, cows produce heat and this is normally more than enough to keep them warm. The rate of heat loss from the body depends on several factors related to the cow (energy intake, liveweight, condition score and coat depth) and the environment (rain, ambient temperature and wind speed). If cattle lose heat faster than they can produce it from digestion and metabolism, they will suffer from the effects of cold. The biggest cause of heat loss is the evaporation of water from a wet coat and this is exacerbated by wind chill.

The Lower Critical Temperature (LCT) of a dry suckler beef cow can be as low as -14°C in still, dry conditions but in wet and windy conditions this can rise to +14°C or more. The effect of coat dryness and wind speed on LCT can be seen in Figure 1 and the resulting metabolisable energy (ME) requirements for cows at an ambient temperature of 0°C are shown in Figure 2.

Figure 1 - Effect of wind speed (m/s) and dry or wet coat on LCT of a dry suckler cow (°C)

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<thead>
<tr>
<th>Wind Speed (m/s)</th>
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<td>0</td>
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Figure 2 – Effect of wind speed and dry or wet coat on ME requirements of a dry suckler cow

The temperature at which animals lose heat faster than they can produce it is called the Lower Critical Temperature (LCT). Ambient temperatures below this will require the cow to produce more heat to maintain her body temperature and this has to come from mobilised body fat. Out-wintering may not be suitable for cows in poor condition or where high performance is required since this drain on resources presents a challenge to welfare. Alternatively extra feed must be supplied to make up the shortfall and this extra cost will out-weigh any management advantages.

Extra feed requirements

Expecting animals to meet their extra energy requirement from body reserves is often inappropriate, particularly in thin cows and at high wind speeds/wet conditions. Although these conditions may prevail for only short periods during the day, extra feed must be supplied to meet the energy needs to combat the effects of cold and wet conditions as illustrated in Figure 3.

Should high levels of concentrate feeding be required, this may render the system unviable so an alternative feeding system needs to be found. Given good ground conditions, forage crops such as kale can be very high quality with an ME of 11 MJ/kg DM and 14-17% Crude Protein (CP). These need to be fed at an appropriate daily allowance in conjunction with a suitable long fibre source such as silage, hay or straw.

When feeding forage crops such as kale it is recommended that the daily Dry Matter Intake of the forage crop should be no more than 50%, with the balance coming from a long fibre source or concentrate (for growing stock). In addition, brassica crops are low in the trace elements selenium, iodine and copper so a free access mineral supplement containing these elements should be provided.

Figure 3 - Effect of wind speed (m/s) and dry or wet coat on extra concentrates required by a dry suckler cow (kg/d)

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<tr>
<th>Wind Speed (m/s)</th>
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Out-wintering cattle successfully
Shelter

An alternative to providing extra costly feed is to provide some shelter so that the cattle can avoid the wind and the worst of the rain. Cattle naturally seek shelter from the wind if it is available and in doing so, reduce the rate of heat loss from the body and the calculated LCT is reduced. Experiments have shown that if the cattle can find shelter it is sufficient to substantially reduce any extra energy demand from wet and windy conditions.

Shelter should protect the cattle from a number of wind directions and it should extend to about 0.5 to 1m above cow height. The shelter area should be well drained and dry out quickly after rain. The shelter can take many forms: shelter belts, open areas in woodland, banking at the side of corrals, access to old buildings and areas in the lee of a steep hillside.

Dry lying area

Cattle normally spend about half the day lying. Being able to express their lying behaviour is very important to cows, so it is essential that ground conditions in at least part of the out-wintering field are suitable. This was clearly demonstrated in a study where the lying behaviour of out-wintered cows was recorded with or without access to a shed. For a period of 12 days in the middle of the experiment the ground was covered with snow. Although lying times for the two treatments were similar for most of the time at around 50% of the day; when there was snow cover the lying time was severely restricted to about 35% of the day in the cows that did not have access to the shed. Other studies have confirmed an inverse relationship between lying time and the moisture content of the lying surface. If cows are forced to lie down in muddy conditions, the mud becomes caked to the coat and this reduces the effectiveness of the hair in insulating the cow from the effects of cold.

The need for well drained areas means that on some farms (where the climate and soil type are inappropriate) out-wintering should not be contemplated. Even when the soil conditions are favourable, if the weather is particularly bad for a prolonged period then the cows should be housed to avoid harm to their welfare. Therefore some provision should always be made for adverse conditions—a back-up plan that could include housing, stocks of silage/hay etc.
Signs of cold stress

The indicators of wet conditions and possible lying deprivation are clear:

• excessively muddy coat
• churned up areas in the field

However, clear visual signs of cold stress in cows are not so obvious and continual monitoring of body condition is required.

Feeding out-wintered dry suckler cows to condition score targets

Management of the annual feed requirement of the spring calving suckler cow is based on target condition scores at critical times of the year. Ideally the cow should be in condition score 3 at weaning and then there can be a slow loss of condition over the winter to condition score 2.25 at calving. Achieving these targets is highly dependent on correct feeding and prompt remedy of developing problems. For the out-wintered cow this is particularly important and an extra energy allowance of 10 to 15% is commonly applied to ensure there is sufficient energy to combat possible periods of cold demand. One unit of condition score is around 13% of body weight so for a 650kg cow starting at condition score 3 the loss of condition over the winter equates to a weight loss of 0.4kg/day.

Pregnancy requirements increase exponentially towards calving, and if the requirement is set at eight weeks before calving a flat rate can be fed through the winter. This translates into a metabolisable energy (ME) requirement of around 75MJ/day. For cows that are out-wintered the extra allowance translates to a requirement of around 85MJ/day.

Out-wintering is not suitable for heavy soils where excessive poaching will occur; so free draining soils are preferable. It is also not advisable on steep slopes that increase the risk of soil erosion and nutrient run-off. Areas that are adjacent to watercourses or springs should be avoided.

Generally feeding forage crops in situ along with forages placed in the field before the winter period is preferable to systems requiring daily silage feeding. This minimises run-off as there is no requirement to drive tractors into these fields during the winter. Soil erosion, run-off and compaction will be more likely from tractor wheelings whilst water tends to stay in cattle hoof prints rather than run-off.

If driving a tractor into a field is unavoidable then drive across slopes rather than up or down (bearing in mind normal safety procedures).

When grazing a forage crop it is also advisable to start grazing the field at the top of a slope so that any potential soil run-off is “caught” by the remaining crop. If troughs and ring feeders are required they should be located in well-drained areas and moved regularly to avoid poaching.

Further information on establishing crops for out-wintering can be found in an accompanying Farming Connect fact sheet; Out-wintering: Establishing and Utilising Crops.
Conclusion

If the production benefits of out-wintering are to be achieved, it is essential that conditions are not detrimental to the welfare of the cattle. Some form of shelter (natural or artificial) must be provided to allow the cow to combat the effects of wind chill and a well-drained dry area is essential for comfortable lying. The condition score of dry cows should be monitored and the amounts of feed should be adjusted well in advance to ensure that cows are at the appropriate condition score at calving. For growing stock, their performance needs to be carefully monitored so that target weights by the end of the out-wintered period are met. In addition to cattle welfare, thought must also be given to any environmental issues that may arise.