

Farm Animal Welfare Advisory Council



Calf Welfare Guidelines



Department of
**Agriculture,
Fisheries and Food**

An Roinn
**Talmhaíochta,
Iascaigh agus Bia**

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1. Introduction

There is growing agreement that welfare is an important component of the social sustainability of modern animal production systems. Under the One Health, and more recently the One Welfare concept (which encompasses health), the welfare of the farmer and his or her animals are mutually inclusive. Work routines and facilities that promote a safe working environment for farm workers are basic requirements for physical health. Importantly, the Health and Safety of anyone working on a farm should be addressed in the farm safety statement which is a statutory requirement of the Safety, Health and Welfare at Work Act, 2005 (Safety, Health and Welfare at Work (General Applications) Regulations, 2007-2016).

Good animal welfare, which is increasingly defined as animals having “a life worth living”, has many real benefits for producers to consider. Healthy and happy animals are more productive and are more resistant to disease, requiring fewer veterinary interventions, and fewer antibiotics. Even more importantly, good animal welfare is crucial to maintain consumer trust and social licence. Stakeholders grant social licences based on the credibility and relationships companies develop within communities and when their own values and those of a company/industry are aligned.

New challenges for animal welfare have arisen with the rapid increase in the size of the dairy cow herd in Ireland. Therefore, a key focus of these guidelines is on the welfare of the artificially reared, dairy-born calf (although the guidelines also cover practices specific to suckler calf production such as weaning).

Key factors taken into consideration include:

- Challenges in sourcing labour and more animals on farm meaning that farmers are under increased time pressure.
- Compact calving such that a high proportion of cows calve over a short time period (6-8 weeks) resulting in a high number of vulnerable animals (neonatal calves and peri-parturient cows) on the farm at the same time.
- The increasing trend for calves to be moved off farm at a young age; including the increased potential for replacement heifer calves to be transferred to contract rearing facilities.
- The increase in the number of calves born from the dairy herd that are destined for beef or veal production and which will be artificially reared.
- Increasing evidence that pain and health problems in young calves have a profoundly negative impact on their future health, welfare, productivity and longevity (important in the case of dairy heifers).

It is therefore important that anyone coming into contact with calves realises that they have responsibility for the animal's welfare. This includes the dairy farmer who bred the calf, contract rearers, calf dealers, handlers at marts and in slaughter plants and the beef or veal farmer who buys the calf. Areas of importance include the feeding, housing, transport, handling and general husbandry of the calf from birth. Each calf's welfare must be treated with equal importance, regardless of their saleability or economic value. The production of low value, surplus animals, "is a key social licence risk, with consumers increasingly concerned about how animals are farmed. In the future, new technologies such as sexed semen or new systems of production, such as dairy bull beef or veal systems may have a role to play in managing non-replacement calves."¹

ICBF have introduced a dairy-beef index (DBI) to rank beef bulls best suited to produce beef from the dairy herd. The index is based on a sire's estimated genetic potential to produce profitable, high quality cattle, born with minimal consequence on subsequent performance of the dairy dam. This index includes traits related to calving, efficiencies of production, carcass merit in terms of yield and quality, as well as addressing societal demands. Given the perception that male calves born to Jersey cross cows are particularly unsuitable to finishing (for beef or veal) it is crucial that Jersey genetics are exploited responsibly. Serious consideration should be given to the use of sexed semen and greater use of high DBI beef sires. Required replacement numbers should be considered carefully, considering that it may be necessary to retain male calves longer on the breeding farm in order to increase saleability in the marketplace. In general breeding for dairy type offspring should utilise high EBI sires and be limited to the extent that dairy replacement calves are required on the farm (or where the business is the production of dairy breeding animals for sale), whilst breeding of all other animals should seek to maximise the potential beef value of all calves born.

¹ Costa, J. H. C., M. A. G. von Keyserlingk, and D. M. Weary. 2016. Invited review: Effects of group housing of dairy calves on behavior, cognition, performance, and health. *Journal of Dairy Science* 99(4):2453-2467.

2. The Five Freedoms

The Five Freedoms provide a framework that underpins best practice to ensure animal health and welfare at farm level.

- 1. Freedom from hunger, thirst and malnutrition**
 - Absence of hunger
 - Absence of thirst
- 2. Freedom from discomfort**
 - Comfort around resting
 - Thermal comfort
 - Ease of movement
- 3. Freedom from pain, injury and disease**
 - Absence of injuries
 - Absence of disease
 - Absence of pain
- 4. Freedom to express normal patterns of behaviour**
- 5. Freedom from fear and distress**
 - Good human-animal relationship
 - Positive emotional state

In acknowledging these freedoms, those who care for animals should practice:

- Caring and responsible planning and management.
- Skilled, knowledgeable and conscientious stockpersonship.
- Appropriate environmental design (for example, of the husbandry system).
- Considerate handling and transport.
- Provision of continuous access to fresh drinking water and a diet to maintain full health and vigour.
- Number of water troughs should reflect the number of calves and if the numbers increase, provision of troughs should also increase.
- Provision of an appropriate environment, including shelter and a comfortable resting area.
- Prevention, rapid diagnosis of disease and treatment of the disease.
- Provision of sufficient space and proper facilities.
- Ensuring conditions and treatment to avoid suffering.

3. Calf Behaviour

Calves are social animals and capable of forming long lasting social bonds from early age. They learn through observation, first from their mothers and then from other calves. For example, calves learn to graze faster if introduced to pasture alongside experienced calves. Calves are highly motivated to make full social contact with other calves. Group housed calves tend to be more confident in social situations (e.g. regrouping), showing less stressful reactions (e.g. vocalisations) when confronted with unfamiliar objects or situations (e.g. unknown feeding, weaning)². Therefore, **lack of social contact has direct detrimental effects on the welfare of young calves.**

To maintain good health and welfare, calves require time to rest and exercise, particularly when they are very young and still growing. Resting behaviour is affected by environmental factors such as bedding quality and quantity, ambient temperature, space and by method of milk feeding. Calves fall asleep sooner after being milk fed with a rubber teat than with an open bucket. Studies show that giving calves the opportunity to suck milk increases the amount of deep sleep, which is beneficial for their brain development³. This in turn can have positive implications for the ease of management, for example in females when they enter the milking herd.

Play behaviour helps with muscle and bone strength and development. It also provides an opportunity for calves to explore their environment and to develop social skills which are particularly important for dairy heifers when they enter the milking herd in later life. Play in calves includes locomotory play (e.g. trotting, cantering, galloping and bucking) and social play with other calves such as head butting. Male calves tend to play more than female calves. Play behaviour is a positive welfare indicator, so the provision for opportunities to play is important, such as ample space, fresh bedding and social interaction with peers⁴. Play behaviour in calves is reduced or ceases altogether if there is poor health, pain, lack of space or if the calf is stressed because of weaning or separation from its pen mates. Play behaviour is also reduced on unyielding floor types (e.g. concrete).

² Ibid

³ Hanninen, L., H. Hepola, S. Raussi, and H. Saloniemi. 2008. Effect of colostrum feeding method and presence of dam on the sleep, rest and sucking behaviour of new-born calves. *Applied Animal Behaviour Science* 112(3-4):213-222.

⁴ Mandel, R., H. R. Whay, E. Klement, and C. J. Nicol. 2016. Invited review: Environmental enrichment of dairy cows and calves in indoor housing. *Journal of Dairy Science* 99(3):1695-1715.

New-born calves suckle five to ten times a day, suckling events reduce as the calf ages; at 6 months of age, calves suckle three to six times a day. In various species including calves, sucking milk increases the secretion of oxytocin and cholecystokinin, as well as other gastrointestinal hormones important for satiety and wellbeing. Calves without the opportunity to suck sometimes start non-nutritive sucking, also called cross-sucking, which can be detrimental - calves may suck the ears, umbilical region or the prepuce of other calves; and this causes inflammation and infection of the affected area. However, a study observing calves from before weaning until first parity found that cross sucking did not appear to negatively affect udder health and production once calves were older⁵. Persistent cross-sucking into adulthood tends to occur between individuals that formed reciprocal cross-sucking partnerships before weaning. Early interventions, such as teat milk feeding, straw bedding, and roughage feeding could reduce the appearance of cross-sucking within a herd and the creation of cross-sucking partnerships.

Calf behaviour is an important indicator of welfare; therefore, understanding its relevance contributes to effective animal management. Farmers and stockpersons have an obligation to learn and understand calf behaviour to facilitate handling, improve general calf management, and improve animal-human relationships which enhance animal welfare.

⁵ Vaughan, A., G. G. Miguel-Pacheco, A. M. de Passille, and J. Rushen. 2016. Reciprocated cross sucking between dairy calves after weaning off milk does not appear to negatively affect udder health or production. *Journal of Dairy Science* 99(7):5596-5603.

4. Stockpersonship

Good stockpersonship is a key factor in assuring optimal animal welfare. New-born and young calves are vulnerable to adverse environmental conditions and stress due to poor management. Hence, **a good stockperson must be conscientious, diligent and patient**. They are empathetic and have acquired specific animal husbandry skills, either developed on-farm, working with an experienced, competent stockperson and/or through a course offered by a suitable training organisation. Formal training and/or experience working under the supervision of a competent stockperson is required where inexperienced persons are taking over responsibility for calf husbandry on a farm.

A competent stockperson should be able to:

- Recognise whether or not calf health or welfare is compromised.
- Understand the significance of a change in calf behaviour.
- Know when veterinary treatment is required.
- Implement a herd health programme i.e. vaccination, preventative measures etc.
- Implement appropriate feeding programmes for calves.
- Recognise whether the environment is adequate to promote good calf health and welfare, and if not, take remedial action
- Handle calves with care, avoiding unnecessary stress.

5. Feed and Water

Calves' early nutritional status influences their development, later productivity and longevity in the breeding herd (in the case of replacement females). Therefore, the feeding programme must provide high quality nutrients including mineral requirements at all stages to maintain good health and to provide for nutritional and behavioural needs. Calves' feeding requirements may vary depending on environmental and individual factors. **Farmers are advised to make a specific calf nutrition plan and to review it regularly.**

a. Feeding of new-born calves

New-born calves require colostrum, the first milk produced by the cow after calving, as this contains special nutrients and antibodies which are essential to protect the calf from disease (**3 litres within 2 hours of birth, from the 1st milking of the cow**). This has a critical influence on the health and welfare of calves. Bovine colostrum is essential to protect the calf against infectious disease. The calf depends on successful transfer of maternal antibodies from colostrum in order to defend itself against infection until its own active immunity begins to work.

The most natural method of colostrum delivery is letting the calf suckle the cow, however, at least for dairy calves; this may result in the calf not getting enough good quality colostrum. Therefore, **best practice for most dairy farms is to hand feed colostrum** to ensure sufficient quantity and quality colostrum is delivered to the calf. When there is any doubt about the quantity or quality of colostrum available from a suckler cow, or if the udder is pendulous and the calf cannot access a teat, the calf should be fed by a teat feeder within two hours of its birth. If the calf is unable to suck (from its mother or from a teat) because it is too weak, colostrum should be given by a suitably trained person using a stomach tube. A store of frozen or some other form of good quality colostrum should be kept on the farm for use in such emergencies. However, it is **best practice to feed a calf its own mothers' colostrum**, as the use of pooled colostrum may promote the transfer of infection, for example Johne's disease. To prevent the spread of infection in the herd, it is vital that each calf receives colostrum only from its dam or if this is not possible, only from a low risk animal. Best practice is that calves should continue to receive transition milk from their mother for the first two days of life.

Colostrum quality can be improved by specific vaccination of the cow or the colostrum donor. Veterinarians should be consulted on ways to improve colostrum to protect calves against infectious diseases. The concentration of antibodies in colostrum is diluted in high-yielding dairy cows. Colostrum quality can be measured using a Brix refractometer. Visually assessing colostrum is not an accurate method of determining its quality.

Recommended Best Practice:

- Only use colostrum from the first milking after calving for the first feed.
- Give at least 3 litres of colostrum within two hours of the calf's birth.
- Check the quality of colostrum with a Brix refractometer; good quality colostrum should contain at least 50g IgG per litre to ensure sufficient transfer of passive immunity, measured as $\geq 22\%$ on a Brix refractometer.
- Apply strict hygiene practices in the collection, storing, and feeding of colostrum.
- If storing colostrum, it needs to be refrigerated or frozen within 3 hours of collection to minimise bacterial growth.
- Collect colostrum as hygienically as possible, as soon as possible after calving. Colostrum quality decreases the longer after calving that the cow is milked for the first time.
- Thaw frozen colostrum slowly at temperatures below 50°C as greater temperatures will damage the antibodies in the colostrum.

If stomach tubing is necessary, this must be done carefully by a suitable trained person; incorrect stomach tubing can severely damage the calf and can be fatal. The most important aspect of the technique is to ensure that the tube/colostrum goes into the oesophagus and not into the trachea. This can be achieved by feeling with your hands on the calf's neck the tip of the tube in the oesophagus on the left-hand side of the calf's neck before administering the colostrum (if the tube is in the trachea the tip cannot be felt due to the tracheal cartilages).

Tube feeding should only be used for weak calves that cannot suckle independently.

- Ensure proper cleaning and sanitation of the stomach tube between calves.
- Feed transition milk (2 – 8 feeds after calving) to calves for at least 2 days (4 feeds) after the first colostrum feeding, especially if using calf scour vaccinations.

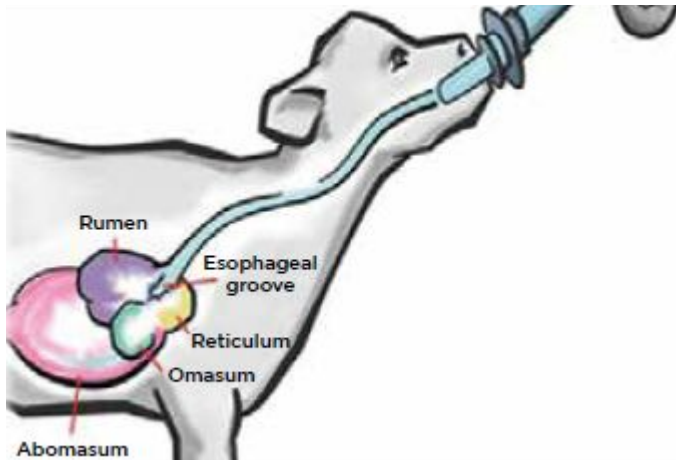
For further information on colostrum feeding management, please refer to: Teagasc Calf Rearing Manual – Section 1: The New-born Calf or Animal Health Ireland guidelines on feeding colostrums.

b. Hand-rearing calves

i. Methods of hand rearing calves

Following colostrum, calves must be fed with transition milk which is the 2nd to 8th milking, for the next 2 to 4 days. Transition milk must be stored in a way that minimises bacterial count by cooling and keeping in a refrigerator. **Following the transition milk feeding period, either whole milk or good quality milk replacer can be fed.** Any of these can be given via a teat (preferable) or bucket, and at a frequency of **twice daily or *ad libitum* or with a computerised feeder.** When selecting a feeding method, several factors should be considered, which include the number of calves to be fed, the type of housing, amount of milk or milk replacer to be fed, and the availability of labour. **All calves should receive liquid food twice every day during the first four weeks of life** and, in any case, until they are eating enough solid food. **Calves should not be fed once a day if they are under four weeks of age.**

In a new-born calf, the abomasum or fourth stomach is the only stomach that is functioning. Teat feeding promotes suckling behaviour which triggers a reflex causing the closure of a groove at the entrance to the rumen (oesophageal groove). Milk passes directly into the abomasum where it is digested. Teat feeding is more natural, calves show a higher degree of relaxation after a meal, and it also satisfies sucking motivation, reducing undesirable behaviours such as cross-sucking. The use of bucket feeding may not activate the closure of the oesophageal groove causing the milk to go into the rumen. At this age the rumen is not functioning, so the milk is not digested and ferments, causing the calf to scour.



Calf Digestive Physiology

Automated calf feeders are computer-controlled systems that are generally used with group housing as it facilitates individualised milk feeding regimes. They offer the opportunity to raise pre-weaned dairy calves with less manual labour than traditional systems while still optimising growth potential. They also offer the calf the ability to choose the timing and frequency of feeding. Nonetheless, backup systems (manual) are required for automated feeding systems during power outages and technical failure. Stockpersons should check the intensity of feed monitoring or implement regular monitoring of feeding (multiple times daily) thereby anticipating and preventing any issues around regularity of feeding.



Recommended Best Practice:

- Feed calves at least twice a day with milk or milk replacer at least until 4 weeks of age.
- Calves should have continuous access to water from birth.
- In artificial calf-rearing systems, calves should be able to reach and drink from a teat feeder.
- If a non-teat bucket is used, the base of the bucket should be at least 30cm above the ground to help the oesophageal groove to close.
- If teat feeding, ensure the height of the teat is at normal nose height to the calf so that the calf keeps its neck and head up while drinking (usually 700-800 mm above floor level).
- If automated calf feeders are used, ensure they are working properly by carrying out checks at least twice a day.
- Calibrate the automated calf feeder at weekly intervals and when introducing different brands of milk replacer or different batches of the same brand.
- Ensure to use only free flowing milk replacers for automated calf feeders.
- Clean automated calf feeder mixing bowls daily and 'milk lines' three times a week.
- Ensure that a calf feeding protocol is in place in the case of power disruption or reduced water supply to the automatic feeder, and that all stockpersons are aware of how to implement the protocol.

ii. General requirements for hand rearing calves

Good nutrition is fundamental to animal health, welfare and productivity. The optimal amount of milk or milk replacer will vary depending on several factors. For example, under cold conditions, energy requirements increase, as the calves need additional energy to generate body heat. Whole milk is the natural follow-on liquid as this has high protein, fat, and digestible energy content, as well as a good balance of nutrients. Whole milk can be pasteurised to reduce the microbial load and to improve overall milk quality. **Calves raised with their dam consume considerably more than 10% of their bodyweight** (conventional feeding advice) and grow much more rapidly. Hand rearing systems that allow **higher intakes lead to higher body weight gains, improved feed conversion efficiencies, and reduced age at first breeding.**

Abrupt changes in diet, use of poor-quality milk or milk replacer, and force-feeding of milk are all associated with health risks for the calf, including diarrhoea. Environment and housing quality also have a significant effect on calf welfare. Calves require additional energy for maintenance and growth if they become cold-stressed at temperatures below approximately 10°C. *Ad libitum* teat feeding of milk to dairy calves increases milk intake and weight gain with no detrimental effects on intake of solid food after weaning. Milk temperature can also affect feed intake or calf growth, as very cool milk has the potential to lower the body temperature which means that the calf needs to use energy to increase its body temperature. This diverts energy away from growth and development. The lower critical temperature in calves younger than 3 weeks of age is 15°C, therefore in cold climates; the effect of cool milk can be significant.

Recommended Best Practice:

- Provide calves with at least 15% of their bodyweight in milk or good quality milk replacer.
- Calves become cold stressed at moderate temperatures under 10°C. To combat cold stress increase the depth of clean dry straw bedding, and use red lamps and calf jackets, especially for younger calves. For every 5°C drop in temperature below 15°C the young calf (under 3 weeks of age) should receive 50g extra milk powder. Feeding calves at an enhanced level will provide enough energy to support maintenance, growth and the immune system.
- Manage group feeding systems to minimise competition between calves.

When feeding calves in groups, care is needed to ensure that all calves, even the slowest drinkers, can consume what they need.

- When calves are put on unlimited milk-feeding diets, it is important to make sure that they have enough teats to avoid undue competition, they must be carefully observed to ensure that they are all feeding properly.
- Liquid feeds should be fed warm (between 15-39°C), but not above the calf's normal body temperature (39°C); and provided at a constant temperature, i.e. avoid feeding warm milk one day, cool milk the next.
- Avoid overfeeding, rapid changes of diet, or underfeeding to prevent digestive upsets.
- Thoroughly clean and dry all equipment including teats, buckets and 'multi-teat feeders' after every use.
- Ensure that the bedded and feeding areas are on an adequate slope and a drain that removes all waste liquid out of the building.
- Wean suckler calves a minimum of 2 weeks before they are sold or moved from the herd.

iii. Frequency of calf feeding

Under EU law⁶, calves must be fed twice-a-day. Science tells us that for their digestive systems to develop properly, young calves need two milk feeds per day, and they should be fed 15-20% bodyweight/day of milk via a teat twice daily at least until the transition stage of digestion at 4 weeks of age. Calves may be fed milk once a day from 4 weeks onwards; these calves will increase their intake of concentrates to make up for the lack of milk.

iv. Milk replacer

Feeding milk replacer is common practice on many calf-rearing farms, but there is a wide range of milk replacer powders available. It is important to choose a high quality milk replacer, to maintain a high level of hygiene when feeding, and to use the same product throughout the rearing period, provided no issues are encountered with it, e.g. bloat. **Good milk replacer mixes easily in warm water and stays in solution after mixing.** Milk replacers must be used in accordance with the manufacturer's instructions. Stockpersons must take care to use the appropriate weight of powder, and volume and temperature of water to **ensure consistency when mixing milk replacers and also use clean feeding and sanitary practices.** Small amounts of fresh, palatable, high-quality starter

⁶ [Directive 2008/119/EC — minimum standards for the protection of calves](#)

feed, based on the advice of a qualified nutritionist, must be gradually introduced, gradually increasing the amount offered as the calf consumes more over time.

v. Waste milk

Waste milk is milk produced by dairy cows that is unsalable due to insufficient quality (i.e. mastitis), or due to the presence of antibiotic residues. **Such milk should never be fed to calves** as it can contain a high bacterial load and promote the development of antimicrobial resistance. Milk from cows treated with antibiotics or those being treated for mastitis should always be discarded.

vi. Roughage

Fibre is important in a healthy calf's diet, as it promotes the growth of the muscular layer of the rumen and helps maintain the health of the rumen lining through its abrasive effect (preventing papillae clumping together). Forage provision does not need to reduce concentrate intake and consumption of good quality roughage may reduce the occurrence of undesirable oral behaviours such as cross-sucking, as this satisfies the need to exercise foraging behaviour. The initial solid feed should contain 10-20% roughage in the dry matter and offering chopped forage of 3-4cm in length is ideal. Introduce **fibre/roughage by day three and it should be available to all calves by two weeks of age**. A concentrate to roughage ratio of 8:1 by weight is recommended to optimise rumen muscle tone, maintain the health of the rumen lining and to avoid high roughage intake in young calves that could lead to the development of 'hay bellies'. Offer roughage on a 'little and often' basis to ensure that it is kept fresh and encourage intake.

Provide good quality hay or straw as roughage. Ensure the roughage offered is different from the bedding material to avoid calves consuming soiled bedding.

vii. Concentrates

The **intake of calf starter concentrates is the single most important factor in the development of the rumen**, which is very small and undeveloped at birth. Starter intake is important in ensuring a smooth transition from milk feeding to an adult diet at weaning without setbacks to growth. In general, calves are fed a 'calf starter' ration up to 12-16 weeks of age. From there they are switched gradually to a 'calf grower' ration. Take care when introducing solid food. Offer **small amounts of concentrates ('calf starter') during the first week of life, from approximately 3 to 4 days of age and *ad libitum* after 6-7 days**. Offer

the ration to calves after the milk feed. Place it in front of the calves in shallow troughs/buckets to encourage them to ‘nose around’ in it. A good calf concentrate should contain 18% crude protein on as fed basis, a minimum of 12MJ of energy (ME) per kg of dry matter from a grain base, between 8 to 10% of fibre content, and vitamins and minerals. To achieve maximum intake, the ration should be highly palatable, coarse-textured, fresh, free from dust and mould and offered in clean troughs/buckets.

viii. Weaning

Good management at weaning is important to avoid setbacks in growth rate, to reduce distress and to minimise susceptibility to infectious diseases. Time of weaning will depend on the individual management system and on the calf’s individual rumen development. Avoid abrupt weaning. **To minimise stress, mixing of calves should happen either 10 days before or 10 days after weaning.** Similarly, do not carry out painful procedures (e.g. castration) at the time of weaning. Ideally, **disbud or castrate at least four weeks before weaning, or at least 2 weeks after weaning.** Offer fresh forage and weaner mix before and after weaning. Replace feed every day so that the food is fresh and appetising.

Minimise stress to both cows and calves when weaning suckler calves. Take particular care of newly weaned suckling calves, keep them in groups of familiar animals to avoid social stress and cross infection. Avoid routine early weaning of suckled beef calves (at two to three months old) as it can increase the post weaning growth check and reduce their resistance to disease. **Weaning at between six and nine months of age is recommended,** although earlier weaning is acceptable for suckler calves where the cow’s health or body condition is poor. **Avoid weaning by abrupt separation of the calves from their dams;** the weaning process should begin one month before by providing fresh concentrates to calves and where possible, by using a two-step weaning process where the first step is to prevent calves from suckling and the second step is the separation of the calves from their dams.

Dairy calves should not be weaned off liquid feed until the rumen is developed sufficiently to enable them to meet their total feed requirements from solids. In general, this means when they have been eating at least 1kg of starter concentrates per day for three consecutive days. However, if calves are fed *ad libitum* gradual weaning should start after 12 weeks of age. Do not decide on the exact timing of weaning solely based on age; it should be based

on the individual calf's preparedness for weaning. Once each calf has achieved at least 1kg of starter concentrates, reduce the milk or liquid feed volume over a period of 7 to 14 days. Evidence shows that this method of weaning (step weaning) results in better dry matter intake post-weaning and is less stressful for calves, thus having positive welfare implications.

Recommended Best Practice

- Keep stressful environmental and management practices to a minimum during weaning.
- Do not conduct painful procedures at the time of weaning.
- Ensure calves always have access to fresh forage and concentrates before and after weaning.
- Ensure that calves are ready for weaning and that they are eating 1kg of starter concentrates for three consecutive days before starting to wean.
- For beef calves, carry out a gradual two-step weaning between the age of six and nine months.
- For dairy calves, carry out a step-down weaning (by decreasing milk volume over 7-14 days) starting at 8 or 12 weeks of age.

c. Pasture

If calves are healthy and thriving, they can go to pasture depending on the weather. Once on pasture, it is **important to continue to feed concentrates for at least one month to maintain performance**. The amount fed and the length of supplementation depends on the calves' age and weight and the quality and quantity of the grass available. Grass quantity and quality are climate dependent; stockpersons need to remain alert to the welfare and productivity problems this can create and plan accordingly.

Ideally, calves should not be on pasture grazed by calves within the previous year. **Consider a leader-follower system** as this provides younger animals with the best quality grass while reducing their risk of picking up intestinal parasites. The leader-follower system consists of allowing the younger animals onto a paddock, strip or block before the adults. If this is not possible it is important to have a **parasite monitoring programme** in place by faecal sampling and egg count assessment. Ensure that pastures are well drained, and fences are safe and properly maintained. Provide access to **clean water and to shade or shelter**.

d. Water

Fresh water should be continuously available in the pen and at pasture. Liquid in the rumen provides an ideal environment, combined with the absence of oxygen, for the rapid growth of bacteria. As milk bypasses the rumen, it does not provide enough liquid for optimal rumen development, therefore the calf must have free access to water at all times. Offering water from birth helps to increase calf weight gain, promotes starter intake and reduces the incidence of scour. **Calves need to drink five litres of water in addition to their milk feed for each one kg of dry feed they consume.** Calves dehydrate rapidly during incidences of scour or increased temperature events, but also during transport. Therefore, it is important to ensure that sources of clean water are always available and that stockpersons know how to evaluate dehydration levels of calves by examining skin tenting, gum condition, attitude, and ability to stand or suckle.

Recommended Best Practice:

- Maintain water buckets separate from feed buckets to prevent grain getting into the water and vice versa.
- Regularly test the water to ensure its quality and palatability; test the water annually for minerals, nitrates, total dissolved solids and pH, as well as contaminants.
- Regularly clean and maintain troughs.
- Ensure that at least one drinking space per ten calves is available unless they are on an ad-libitum milk feeding system.
- All water troughs/bowls must always be capable of delivering water in enough quantities (check flow rates regularly).
- Locate water trough/bowls in an area that prevents wetting/fouling of the bedded areas of the calves.
- Ensure calves are well hydrated and that stockpersons know how to recognise symptoms and level of dehydration.
- In the event of a water delivery system failure, take swift remedial action to ensure that daily water requirements are met.

6. The Physical Environment: Housing and shelter

Calf welfare depends not only on the physical housing system, but also on the way it is managed. Housing system design should take into consideration environmental and management factors and ensure good health, comfort, and safety. The system should allow calves to express innate behaviour and should optimise their comfort; it should be designed to avoid suffering from pain, fear, injury or distress.

For further information on calf accommodation and physical environment, please refer to: [Teagasc Calf Rearing Manual – Section 5: Calf House Management](#).

a. Calving pens

Calving is a critical period for the health and welfare of both cow and calf; therefore, clean and well-maintained calving facilities and equipment are of paramount importance. In addition, well-designed calving pens benefit the cow and farm workers who supervise calving. At a minimum all calving facilities should be clean, well-bedded, well-illuminated and have a plentiful supply of clean water. Lighting should allow inspection of animals and provide safe working conditions. Loose pens, wood chip pads or paddocks can be suitable for calving provided they are well managed. It is essential to have enough calving facilities. The size and number of calving boxes depends on the number of cows and the calving pattern of the herd. They should never be used to house sick animals.

Recommended Best Practice:

- Individual straw bedded calving boxes (one 4m × 4m pen per 25 cows) according to calving pattern.
- Calving facilities should be equipped with a self-locking restraining gate.
- Calving facilities must be equipped with a feeder and source of water.
- Maintain good lighting and ventilation in calving pens; minimise drafts.
- Provide fresh bedding between calvings.
- Thoroughly clean and disinfect calving pens, and ideally do not use these for 3 to 4 months after each calving season

b. Housing

Calves in individual housing must have sufficient space to stand up, lie down, turn around, stretch and groom; and they must be allowed direct visual and tactile contact with other calves (except those in isolation for on veterinary advice). In group

housing, there must be enough space for all calves to be able to lie down comfortably at the same time. Tethering of calves is prohibited. Young calves are particularly susceptible to pneumonia so **good ventilation is essential**. Never restrict ventilation rates to increase the air temperature. Insulation, heating and ventilation of the building must ensure that the air circulation, dust level, temperature, relative air humidity and gas concentrations are kept within limits which are not harmful to the calves.⁷ Therefore, housed calves need an environment that is:

- dry;
- well drained;
- well bedded;
- well ventilated; and
- draught free; and
- Rodent and bird proof.

Until weaning, house calves in small groups to facilitate daily inspection and to limit the spread of disease. Other penning arrangements may be satisfactory for calves suckling their dam. **New-born and young calves should not be kept on totally slatted floors and should always be on bedding**. Maintain the housing environment to avoid injury caused by falls on slippery surfaces or abrasions from sharp edges. Any type of calf housing must be clean and disinfected between batches/calves.



⁷ [S.I. No. 311/2010 - European Communities \(Welfare of farmed animals\) Regulations 2010.](#)

i. Type of housing

Individual pens

Calves can be housed in individual pens from birth to a few weeks of age, but for no more than 8 weeks. Individual pens must allow the calf to turn around and lie down comfortably: approximately 1.0m wide by 1.5m long, and 1.7m recommended for isolation pens. Calves older than eight weeks of age can only be kept in individual pens if a registered veterinary practitioner certifies that due to its health or behaviour it is required to be isolated in order to receive treatment (S.I. 311 of 2010). Use of solid walls in individual calf pens is not permitted; calves must be able to have visual and tactile contact with neighbouring calves.

Hutches

Hutches must be made of a material which minimises heat stress and wide temperature fluctuations. **Ventilation** must function to remove excess humidity and condensation whilst at the same time eliminating draughts but retaining constant air circulation. Tethering of calves is prohibited. Hutches must be placed on a free-draining base able to collect any effluent to a suitable site for disposal and affixed to the ground to prevent movement in high winds. Hutches must be **sheltered**, away from prevailing weather. There must be enough bedding in the hutch to exclude any draughts, and **calves must have access to a dry bed at all times**. Hutches must be of a size appropriate to the age and breed of the animal.

Group pens

Pair or group housing of calves soon after birth can increase weight gains and intake of solid feed. In addition, group housing aids behavioural and social development of calves, increasing their learning ability and allowing them to adapt more easily to new environments. Group pens must provide **sufficient space** to allow all calves to lie down at the same time in a normal resting position without difficulty; and to allow all calves to stand up, turn around, lie down, rest and groom themselves. **Calves should be grouped in accordance with age and size, keeping calves in stable groups leads to higher daily live weight gain**. Ideally, calves can in groups of 4 to 6 calves per pen for the first week depending on the farm and progress of the calves; subsequently, calves could be kept in groups of 12 or less, always providing sufficient space per calf and avoiding overcrowded conditions. It is recommended to use **all in-all out systems** to reduce the risk of disease

Outdoors in group pens

Outdoor group pens must be kept dry and well-bedded, the use of **straw is preferred for young calves**. Pre weaned calves should have a **roofed shelter** or access to natural shelter to protect them from weather conditions, and pens must be located in areas with **adequate drainage and protection from high winds**. Only healthy calves should be outdoors in group pens. They must be provided with adequate amounts of energy, always considering the weather conditions. Shelters or pens must be moved regularly if the area is getting poached, contaminated or dirty. All outdoor shelters or hutches should be well ventilated, and animals should be inspected at regular intervals. Group pens must allow **at least 1.5 m² space per calf**.

ii. General housing requirements

Bedding

Young calves spend about 80% of their time lying; therefore, type and depth of bedding material are important. **Calves must have constant access to a lying area which is well drained and/or well-maintained with dry bedding**. They should not be lying directly on concrete, slats or rubber mat floors. Bedding material capable of providing a high ‘nesting score’ * is recommended, as it works as a good insulator reducing the amount of heat lost via conduction.

*‘Nesting score’ refers to how much of the calf is covered/how well they are bedded as opposed to being a quality of the bedding material.

Dusty bedding should be avoided as this can create respiratory issues in calves and/or the stockperson. Good quality bedding material also helps prevent against calf respiratory disease in naturally ventilated sheds. Deep straw bedding is very effective and if used it should be at least 15cm deep and should remain dry at all times. Other recommended materials are wood shavings and bark chips for older calves. Treated wood/pine shavings or sawdust should not be used as these can be toxic if consumed. Peat should be avoided as it is environmentally unsustainable. Further information is available at:

<https://www.teagasc.ie/media/website/publications/2017/Section5-Calf-accommodation.pdf>

Drainage

A drainage channel should be positioned underneath the feeding and watering area to run away from the bedding and pen flooring with a slope towards the channel. Pen flooring should facilitate easy cleaning and removal of waste.

Drainage channels should take the waste outside the building to a ventilated storage tank. Good drainage design should ensure that waste does not drain from one pen through another as this can spread disease. Drainage from hospital or isolation pens must be separated from any other drainage system.

Ventilation

Successful calf house ventilation increases calf comfort and is vital in disease prevention. Total airborne bacteria count increases with poor ventilation which is associated with respiratory disease. Good ventilation also eliminates noxious gases (i.e. ammonia), draughts and stagnant air, while maintaining optimum ambient temperature and environmental humidity levels. Natural or assisted ventilation systems must always be designed and managed to maintain air quality (i.e. ammonia levels < 25ppm). Assisted or automatic ventilation systems must contain an alarm that gives adequate warning when there is a failure of the system function or when the main electricity supply fails. In addition, a back-up system must be in place to guarantee sufficient air renewal in the event of the failure of the primary system. Meshes should be placed over vents to prevent access by birds.

Lighting

Housing should be provided with adequate daylight, or artificial light to aid inspection of calves and to meet behavioural and physiological needs. Artificial lighting must follow a natural light pattern, for example 9am to 5pm. Dark periods must be provided to ensure adequate resting behaviour.

Bird and rodent proofing

Animal housing should be bird-proof as far as is practical. Rodent control requires an integrated pest-management strategy. The first objective should be to prevent, or at least greatly reduce, rodent numbers through management programmes that eliminate entrance to the facility, nesting sites for the rodents, food supplies and water. If problems persist, farmers may find advice from professional pest control personnel helpful who can assist with identifying entry/nesting sites.

c. Shelter at pasture

Calves at pasture are exposed to the effects of the weather. Stockpersons must remain alert to the health and welfare of calves at pasture. Extreme weather conditions can create welfare risks related to hypothermia which can lead to suffering and in extreme cases, death. If calves are seen with hunched backs and huddling and shivering

together, they are showing signs of cold exposure. If exposed to heat stress, caused by consistent ambient temperatures of 20 – 22°C or more, their respiration rate will increase, grazing activity will reduce, and they will seek shade and consume more water. If the heat continues to rise, animals will progress to open mouthed panting with tongues extended in severe cases.

At a minimum, shelter from wind and rain should always be provided, particularly for young stock outdoors for the first time. Shelter/shade must be located in a well-drained area and can be in the form of hedgerows, trees, buildings, windbreaks or topographical features. Consideration should also be given to the provision of **shade for calves outdoors** during hot weather in the summer. Other ways of reducing the heat load on calves during hot weather conditions include plentiful provision of drinking water, and movement of animals at their own pace (best practice irrespective of the weather).

7. Husbandry Practices

a. Training for stockpersons

Management practices (e.g. milk feeding, machine cleaning) used on dairy farms have a significant impact on animal health, animal welfare, and milk quality. Implementation is equally important. Attributes such as a positive attitude toward animals and being detail oriented (e.g., good record keeping, knowledge of individual animals) contribute to the implementation of best management practice.

Human-animal interactions affect the productivity and welfare of calves. Not only is the technical competence of animal handlers important but also the way in which they interact with animals. Poor knowledge about calves increases the likelihood of rough handling, which results in a fearful animal. Fear leads to stress, reduced welfare, and reduced productivity (e.g. reduced feed intake and poor weight gain).

Recommended Best Practice:

- Farmers must lead by example and ensure best management practices are in place.
- Ensure that personnel in charge of handling calves have received adequate training before they start working with animals.
- All stockpersons should be familiar with, understand and apply the animal welfare guidelines.
- Training must be based on low-stress handling techniques and regular training updates training must be provided to all those involved with handling calves.
- Farmers and all stockpersons must ensure that their interactions with calves and younger cattle are rewarding rather than aversive.
- Avoid behaviours that are aversive to calves (e.g., hitting, shouting, aggressive tail twisting, electric prods and kicking).
- Farmers must ensure that animal handlers understand the behavioural principles of animal handling and understand how their attitudes and behaviour impact dairy calves' welfare and productivity.
- Ensure equipment, holding, and handling facilities are in place and in good working order.

b. Mating and care of cows in late pregnancy to reduce risk of dystocia

Dystocia (i.e. difficult calving) has a detrimental impact on the welfare of the cow and calf, and in extreme cases may result in death of the calf and/or injury of the cow. Hence, it is crucial that before the first insemination, dairy cattle should be of suitable age, size and condition for pregnancy and calving to minimise the risk of dystocia occurring, and that caesarean section does not become a routine procedure. Choice of bull is also important to ensure appropriate calf size, reflect the purpose of breeding (dairy replacement or beef production), and to avoid a long gestation period. Easy-calving bulls should be selected for heifers. The maintenance **of body condition score within the range 3.0 to 3.5 for the cow at calving** is crucial to prevent calving problems.

c. Calving

Compact calving is an important management tool in matching milk production to grass growth. However, it can pose a threat to animal health and welfare because of the high proportion of vulnerable animals (i.e. neonatal calves and peri-parturient cows) on the farm over a short but very busy time. This can be compounded by labour and facility challenges. Clean and well-maintained calving facilities and equipment are of paramount importance to both cow and calf health and welfare.

Recommended Best Practice:

- Never induce cows to calve.
- Cows close to calving should be checked at least twice daily and moved to the calving facilities before calving commences in order to minimise stress.
- The calving area must be kept clean prior to, and after, delivery of the calf in order to minimise the risk of disease.
- If a cow, and particularly a heifer, has already started calving when checked, it is best not to move her until the waterbag or foetal hooves are visible.
- If in any doubt about how a cow is progressing, a vet should be called to avoid injury to the cow and calf (see AHI document on Calving and Care of the New-born Calf for detailed information on when and how to intervene).
- Ensure good restraint of the cow to ensure safety of the farmer/stockperson/vet.

If an animal is having difficulty giving birth, the cow should be examined to confirm an unrestricted birth canal and that the calf is properly presented and of a size where natural delivery can be reasonably expected. When deciding to assist a cow to calve, the amount and direction of traction must be considered as well as to whether there is

adequate lubrication to facilitate delivery and whether the cow is able to stand, or whether she must be calved lying down. Assisted calving must be carried out without causing undue pain and distress to either the cow or calf. Excessive force should never be used when calving cows; **routine use of calving jacks is not recommended.**

Recommended Best Practice:

- Ensure that good, clean and well-maintained calving equipment is always available in the calving unit.
- Ensure that stockpersons in charge of the calving unit are trained and can recognise the signs of a difficult calving and when assistance may be needed.
- If using calving ropes, make sure that they are applied above the calf's fetlock and only pull on them when the cow is forcing (pushing or contracting); rotate the calf after the chest emerges.
- Where no progress is made after 5 minutes of controlled traction, veterinary advice should be sought.
- See AHI guidelines: <https://online.flippingbook.com/view/703745/3/#zoom=z> Calving and Care of the New-born Calf.
- Observe all calvings if possible, identify high risk calves during and after birth, and assess the calf for signs of distress and manage accordingly (see AHI leaflet on Calving and Care of the New-born Calf).
- Allow the cow to lick the calf dry; and very weak, cold, wet, shivering calves should be dried off and placed under an infra-red lamp.
- Dress the navel cord as appropriate (see AHI leaflet on Calving and Care of the New-born Calf) and check it regularly for signs of infection during the calf's first week of life.
- Ensure to feed the calf at least three litres of colostrum within two hours of birth (see AHI Colostrum Management information, and this guidelines Feeding Section).
- Ensure calves are born in a clean, freshly bedded calving unit.

d. Automated or mechanical equipment

Electrical circuits and equipment should be installed in accordance with the terms of the National Rules for Electrical Installation ET101/1991 (2nd Edition). On farms that have automated, or mechanical equipment installed that could affect animal welfare, the stockpersons must receive training on how to operate the equipment, carry out routine maintenance, recognise common signs of malfunction and what action to take in case of a failure event. In addition, stockpersons must be provided with a list of emergency contacts in case of a power supply outage or malfunction of the

equipment. All automated or mechanical equipment (including automated feeding systems) must be monitored at least every twelve hours to ensure they are in working condition and any problems can be rectified promptly. Where a defect or malfunction is discovered, and cannot be rectified, appropriate steps must be taken to safeguard the health and well-being of the calves until the equipment is in working order.

e. Painful procedures

Calf rearing involves several husbandry procedures such as ear tagging, disbudding, dehorning and castration, all of which cause pain and distress. These procedures must not be performed on sick animals and should be performed as early as possible. They must never be performed at the same time as other stressful events such as weaning, mixing or transport. The docking of calves' tails is prohibited and must not be carried out. S.I. No. 225 of 2014 Prohibition on Tail-docking (Bovines) (No. 2) Regulations 2014. (See Appendix II for link to Regulations). For further information on ear tagging, disbudding and castration management, please refer to [Teagasc Calf Rearing Manual – Section 7: Tagging, Castrating and Disbudding Calves](#).

i. Identification

Permanent identification by ear tag is mandated by DAFM, and it is an essential part of the Bovine Animal Identification system and the National BVD Eradication scheme. The tagging system requires the application of two identically numbered yellow plastic ear tags to calves born on a holding within 20 days of birth. Other forms of identification such as freeze branding should only be performed by a competent operator.

Recommended Best Practice:

- Identification of calves must be done with care by trained, competent operators.
- Calves must be securely restrained to minimise stress to the animal and decrease risk of injury to personnel.
- Permanent tags should be inserted using the applicators designed for the purpose and according to the manufacturer's specifications.
- Care should be taken when tagging to avoid hitting the cartilage ridges or major blood vessels.
- Calves should be inspected after the procedure to identify any possible infection around the tag area so this could be treated promptly.
- Any temporary identification such as neck bands or leg bands must be securely placed and adjusted as necessary to avoid unnecessary discomfort.

ii. Disbudding

Disbudding is painful for calves, but it is less stressful than dehorning older animals. Disbudding of calves is carried out to reduce injuries to humans and other animals. The only method of disbudding of calves that is legally permissible in Ireland is **disbudding by thermal cauterisation up to 28 days old** - as is set out in S.I. No. 127/2014 - Animal Health and Welfare (Operations and Procedures) (No. 2) Regulations 2014. **It is illegal to disbud or dehorn calves over 14 days old without using a local anaesthetic (LA*).**

*LA products are prescription only medicines and may be administered or prescribed by veterinary practitioners for animals under their care. The owner/person in charge should have appropriate training in the usage of the anaesthetic and may administer it for disbudding on foot of a prescription from a veterinary practitioner. Calves can be disbudded using a local anaesthetic while standing and restrained, so that the calf is held comfortably without causing it distress.

At Teagasc, recent disbudding studies conclude that to optimise effectiveness of disbudding and minimise the risk of adverse welfare, **recommendations on the appropriate time for disbudding should be based on horn bud development rather than calf age**. Horn buds develop earlier in Holstein-Friesian than in Charolais, Limousin and Simmental calves. The Teagasc findings showed that age is not a good predictor for horn bud size.

Recommended Best Practice:

- Ideally, a custom-built calf disbudding crate should be used to minimise stress to the calf and for optimum safety to the operator.
- Only trained operators must carry out disbudding procedures.
- Local anaesthetic must be administered to all calves undergoing disbudding.

iii. Dehorning

Dehorning after the horn attaches increases the risk of entering the frontal sinus and subsequent infection. A **veterinarian should only carry out dehorning in exceptional circumstances**. Handling facilities should provide adequate restraint to minimise stress to the animal. Appropriate pain relief (local anaesthesia/analgesics) must always be administered. Dehorned animals should be checked regularly to ensure that bleeding has ceased or has not started since dehorning.

iv. **Castration**

Castration must be carried out in compliance with S.I. No. 127 of 2014 (Animal Health and Welfare (Operations and Procedures) (No 2) Regulations 2014). Under this legislation, cattle can be castrated:

- Using a Burdizzo (with or without the use of anaesthesia and analgesia) up to 6 months;
- Using a rubber ring up to seven days (with or without the use of anaesthesia and analgesia) in both cases;
- By a veterinary practitioner at any age;
- Younger calves may experience less acute responses to castration than older calves.

Recommended Best Practice:

- Anaesthesia must be used with rubber ring castration of calves older than seven days.
- Where calves are castrated by Burdizzo without the use of anaesthetic, they should be castrated as young as possible and certainly no older than two months.
- Castrating calves of over six months is not recommended. If needed it must be carried out by a veterinary practitioner and using anaesthesia and long-acting analgesia (i.e. NSAIDs).
- After castration, animals should be checked regularly to detect any signs of infection or bleeding.

v. **Removing supernumerary (extra) teats**

Removal of supernumerary (also referred to as extra, sprig or web) teats in calves should be considered as they pose a risk for leakage or entry for infection, as they may be connected to the primary teat, and they may interfere with the machine milking when animals reach milking stage. This operation must be carried out by a veterinary practitioner.

Recommended Best Practice:

- Arrange for a veterinary surgeon to remove extra teats as soon as they are identified.
- Any subsequent infection around the removal area should be treated promptly.

f. Handling, moving and restraining calves

Calves will often need to be handled and restrained to perform management and husbandry procedures such as tagging, disbudding, castration, vaccinating or dosing. Therefore, it is important that young dairy stock are handled positively from a young age to reduce fearfulness, create a positive human-animal relationship, thus improving animal welfare and promoting ease of handling. Stress and risk of injury to the animal must be minimised. Restrained animals should be supervised closely and restrained in a manner that facilitates fast and easy release. It is important to understand the behavioural principles of handling cattle which refers to the flight zone, blind spot and point of balance (see Appendix III). Equipment used for animal handling and restraint must be fit for purpose and used in a manner that does not inflict unnecessary pain or distress.

General principles of good handling:

- Animal handlers must be familiar with cattle behaviour and low stress handling techniques either through training or experience.
- Keep animals calm by handling them quietly, and with patience and confidence – calm animals are easier to handle, move and load. When animals become agitated, it takes up to 30 minutes for them to calm down.
- Move animals at a walk and preferably on flooring/surfaces with good traction – injuries from falls or collisions with gates/fences are more likely if animals are rushed.
- Minimise noise (shouting, whistling etc.) during handling as it is a source of stress.
- Electric prods, whips, sticks, pipes and tail twisting should never be used to handle calves. A flag or paddle stick or other non-electric aid should be the primary handling tools for loading/unloading animals or to encourage animals into a crush.
- Ideally you should always have help when handling calves.
- Avoid moving calves from bright into darkly lit areas. They need to see where they are expected to move to, i.e. if going indoors or into a truck the area should be well lit, and the corridors kept clear with no shiny surfaces.
- Never rush calves when herding. Rushing calves at the rear of the herd will not speed up the time of arrival and is a major risk factor for animals.
- Dogs should not be used for herding calves as they scare them and increase the risk of injury.
- If using a mechanised means of herding (tractor/quad), stay well behind the last calves and allow them to walk at their own pace.
- When restraining animals, use properly designed and maintained restraint devices, and restrain animals for as brief a time as possible.

g. Mixing calves

Moving a calf to an unfamiliar group is stressful; similarly, the introduction of unfamiliar animals or removal of animals from a group causes social stress and fear from the unknown calf or environment. It also increases the chances of injuries and stress due to fighting.

Recommended Best Practice:

- Minimise re-mixing of unfamiliar younger animals.
- Avoid mixing calves of different ages and from different sources.
- Unfamiliar calves should be mixed in spacious conditions, with non-slip, non-injurious underfoot conditions.
- Newly mixed animals should be observed closely, particularly in the first few hours and be prepared to remove animals under severe social stress as a result of bullying which may arise.

h. Fostering calves onto cows

No technique to foster calves onto nurse cows should compromise the welfare of either cow or calf. All techniques should be used with minimum stress to both the cow and the calves.

Recommended Best Practice:

- Calves fostered onto a nurse cow should all be of similar size and age.
- Nurse cows with calves at foot, should be inspected at least once every 24 hours to ensure that both cows and calves are in good health.

i. Pre-transport selection

When selecting animals for transport off farm, consult the FAWAC Transport Document and any relevant legislation (see Appendix II). To reduce the risk of disease, wherever possible, arrangements should be made to transfer the calves as quickly as possible from farm of origin to the purchasing farm. Ideally, young calves reared without their mothers should be accustomed to human contact, preferably from the same stockperson. When calves are being transferred from the farm of origin, it is vital to ensure that the calf is 'fit' for the journey. This is the responsibility of both the farmer selling the calf and the purchaser of the calf. The welfare of young calves is at significant risk during transport, therefore, transportation times (measured from the first animal is loaded to the last animal being unloaded) for calves should be as short as possible. Calves younger than 10 days old should not be moved off farm unless for veterinary treatment.

Recommended Best Practice:

- Calves must be bright and alert, hooves worn and firm, have a dry navel and no scours.
- Calves must be able to stand and bear weight on all four limbs and be fit enough to withstand the journey without suffering unreasonable or unnecessary pain or distress.
- Pre weaned calves must have been fed at least half of that day's ration of milk, not more than two hours before transportation.
- Transport conditions must be guaranteed not to cause injury or unnecessary suffering;
- Journey length – calves must be 10 days of age if undergoing journeys >100km.
- Journey time – the transportation of calves less than 14 days of age on journeys exceeding eight hours is not permitted unless they are accompanied by their mother.
- Weather conditions must be considered.
- If calves fall ill or are injured during transport, they must be separated from the other calves and receive first-aid treatment promptly.

j. Arranging transport

Dairy farmers and calf purchasers have a responsibility to ensure that the transporter they hire is trained and qualified to transport cattle, particularly calves. Council Regulation (EC) No 1/2005 on the protection of animals during transport and related operations is the legislation that governs the welfare of calves during transport in Ireland. For further information please refer to the [DAFM – Transport of Live Animals Website](#).

Recommended Best Practice:

- Ensure only trained people load, unload and transport calves.
- Ensure all required paperwork (e.g., livestock manifests, bills of lading, emergency contact information) is completed and provided to the transporter.
- Ensure loading facilities are compatible with the type of trailer or vehicle being used by the transporter.
- Ensure that any special requirements, if any, of the animals being transported have been discussed with the transporter.
- Ensure that special protection for all calves from cold weather, excess wind and rain is provided in the loading area and during transport.
- Provide suitable bedding material and water, especially for long journeys.
- Make sure that the carrier is experienced in accordance with your needs (e.g.,

short vs. long distance hauls).

- Transporters must provide minimum headroom, when standing in a natural position, of: Calves – 10cm above highest point of animal.
- Provide enough space to calves so they can lie down during transit. Small calves (50kg) require 0.3-0.4m²/animal; medium sized calves (110kg) require 0.6-0.7m²/animal; and heavy sized calves (200kg) require 0.7-0.95 m²/animal.

k. Receiving new calves onto the unit

It is important to make sure there are adequate facilities to unload calves safely and efficiently. Prior to the arrival of new calves, the facilities must be prepared so they can be unloaded without delay and begin acclimatising to their new environment. The facilities on arrival should provide all animals with appropriate care and comfort, adequate space and ventilation, access to water and shelter from extreme weather conditions.

Recommended Best Practice:

- A calf that has become sick, injured or paralysed during a journey must be appropriately and promptly treated; the calf should be unloaded in a way that causes the least amount of stress and placed in a separate pen with the appropriate facilities made available i.e. water, clean bedding etc.
- On arrival, calves must be allowed to rest for 1-2 hours and assessed for general health and hydration status before further handling/feeding.
- After being rested, calves showing signs of disease or dehydration must receive a minimum of 2.5 litres of a proprietary electrolyte solution, with a second feed to be repeated according to manufacturers or veterinary recommendations at an appropriate time.
- If the calves have come from the same source and have travelled for less than an hour, consideration can be given to feeding them the same milk based feed that they have been accustomed to at their previous location, provided there are no apparent signs of ill health.
- Always keep bought-in animals separate from your own stock in a quarantine area for at least a week, observe them carefully twice a day and carry out any assessments and/or recommended tests by your veterinarian.
- Any change in ration should be made gradually over a period of two to three weeks.

8. Health

Prevention of ill-health or distress is much better than cure. Good stockpersons will have effective preventative programmes in place. This will be part of the HERD HEALTH PLAN drawn up in consultation with the attending veterinary practitioner and reviewed regularly. They will also be familiar with their animals' normal behaviour, recognise early signs of disease or distress, have a planned animal health programme in place and take immediate action when necessary.

Recommended Best Practice:

- Stockpersons should be familiar with the more common health problems of calves and organise prompt and/or veterinary attention should they occur.
- Sick animals should be separated from healthy companions to prevent spread of disease and to facilitate handling and recovery of the sick animal.
- Early intervention in any disease process will result in a better outcome. Correct diagnosis and treatment are important.
- Veterinary advice should be sought when;
 - ❑ First aid does not result in satisfactory resolution of the problem;
 - ❑ A calf is unable to stand unaided;
 - ❑ There is difficulty in calving a cow which the stock handler is unable to resolve;
 - ❑ There is concern about the welfare of the animal;
 - ❑ For conditions which are painful and warrant immediate veterinary attention e.g. serious injury, purulent infections, haemorrhage, deep wounds, lameness, severe or chronic inflammation or damage to the eye and surrounding structures;
 - ❑ There is persistent ill-thrift and poor performance which does not respond to treatment.

Signs of illness include any difference from normal appearance or behaviour such as: listlessness, separation from the group, changes in faeces or urine, abnormal swellings or growths on any part of the body, lack of co-ordination when moving, pus or bloody discharge from body orifices, recumbency, physical depression, evidence of pain such as grunting and/or groaning, extreme nervousness and twitching, excess salivation, coughing or difficult breathing, loss of weight or body condition, changes in behaviour and demeanour, changes in appetite and eating behaviour, lack of or

excessive chewing, or lack of gut fill. Conditions which are painful and warrant immediate treatment are serious injury, purulent infections, severe haemorrhage, deep wounds, bone fractures, lameness, severe or chronic inflammation or damage to the eye and surrounding structures.

a. Animal health plan

Farms must have a ‘herd health and welfare programme’ as an essential part of the management system. This should be drawn up in consultation with a veterinary practitioner and relevant advisor/s such as a nutritionist. The main components of such a programme relevant to calves include parasite control/dosing, a vaccination schedule, nutritional management, pneumonia and other disease prevention protocols as well as a biosecurity plan. It is important that calf health and welfare problems are reviewed regularly with the farm veterinary practitioners and the calf health and welfare programme updated as appropriate. Computer-based recording systems for dairy herds are now available and can produce useful diagnostic outputs from simple input records. These records can be discussed with a farm adviser/veterinarian.

Recommended best practice

- Follow current biosecurity protocols on farms to prevent disease transmission.
- Keep up to date training programmes and protocols for animal handlers.
- Every herd operator should have an animal health plan drawn up and updated regularly with their attending veterinarian.
- A recording system relevant to this plan should be kept up to date by the herd operator, because regular monitoring of the records aids management and quickly reveals any problem areas.

i. Vaccination

A vaccination plan is a key component of a health and welfare programme. Advice should be sought from the farm veterinary practitioner before deciding on a vaccination programme for a particular disease. This includes advice on vaccine type, dose, timing of vaccination, and method of administration. The use of vaccines is the main method in preventing clostridial diseases (blackleg, tetanus etc.), but should not be regarded as the sole method of prevention of calf scour and pneumonia.

ii. Parasite control

Parasite infections can cause poor welfare in dairy animals because of discomfort from irritations, loss of body condition and ill health. Therefore, prevention and control are important considerations in the welfare of all livestock. External parasites, such as lice, mite and ringworm, can result in skin irritation, causing the animal to

scratch and be uncomfortable. Internal parasites including stomach worm, lungworm (hoose), liver fluke and coccidia, if not treated appropriately, can result in morbidity and even mortality in severe cases.

It is recommended that:

- Husbandry and grassland management practices should aim to minimise parasite problems where practical (e.g. moving calves to “clean” pasture in midsummer to reduce exposure to stomach worms).
- Preventative parasite control programmes (e.g. lice treatment in housed stock, anthelmintic treatments for young calves at pasture) are implemented to prevent undue parasite burdens in susceptible stock, bearing in mind responsible use of anthelmintics.
- The effectiveness of a Parasite Control Programme can be measured by referring to the Animal Health Ireland Website: <http://animalhealthireland.ie/>

iii. Biosecurity/hygiene

Biosecurity is a term that includes all those measures that may be taken to prevent the introduction of unwanted organisms into, within and out of the herd. (See Appendix II for link to Animal Health Ireland Biosecurity booklets). In brief, proper boundary fencing prevents contact with other groups of animals from neighbouring herds and reduces the risk of infectious disease transferring to the herd. Buying in stock from other sources should be minimised. Stockpersons who take proper precautions when moving within the farm or when moving stock and equipment can greatly reduce the chance of spreading disease. A footbath containing a Department of Agriculture, Food and Marine (DAFM)-approved disinfectant should be provided not only the entrance to the calving houses and calf pens but also outside all access areas. A consistent hand washing/glove use protocol should be in place for all dairy farm activities but particularly around milking, calving and calf care/feeding duties.

iv. Record keeping

Record keeping is an important management tool. Some of these records help producers to demonstrate that best practice has been implemented in relation to animal health, welfare standards and traceability.

Key records include those relating to:

- The Bovine Herd Register (Including disposal of animal carcasses);
- Animal remedies;
- Animal feed;
- Traceability;
- Disease events and control plans;
- Locomotion, body condition scores;
- General management plans.

b. Inspection and treatment

The frequency of inspection of stock depends on the circumstances and management system however it must be borne in mind that the highest risk of calf loss occurs in the first four weeks of life.

Recommended Best Practice:

- Calves should be inspected as frequently as is necessary to detect any problems.
- Any injured or ailing animal should be treated or humanely destroyed by a knowledgeable and competent person immediately.

i. Sick and injured calves

Any calves showing signs of sickness (scour, pneumonia etc.) should be removed immediately and placed in a pen which is designated for sick animals only. They should only return to the group when the calf has fully recovered from illness. The pen which is used for sick animals must be cleaned and disinfected after each use. It must not be also used as an isolation facility for purchased animals/returning from shows. Monitoring body temperature is a useful means of assessing calf response to treatment. However, it is only a guide and is not definitive. In the event calves fail to respond to the applied treatment, or the condition worsens, a veterinarian should be immediately consulted.

ii. Pneumonia in calves

Pneumonia in calves is often referred to as a ‘multifactorial disease’. Besides infectious agents, environmental and management factors may also be responsible for the outbreak of disease. Early diagnosis and treatment of pneumonia is essential for a successful outcome. Symptoms may include increased respiratory rate, dullness, reduced feed intake, discharge from the nose/eyes and high temperature. When pus-like nasal discharge or severe respiratory distress is noted the disease may be advanced. Careful observation of calves at a time when they

are resting (not at feeding time) is required to pick up these signs. Viruses associated with pneumonia include bovine herpes virus-1 (BoHV-1) (cause of infectious bovine rhinotracheitis; IBR), bovine respiratory syncytial virus (BRSV) and bovine parainfluenza type 3 virus (BPI-3); bacteria include *Mannheimia haemolytica* and *Pasteurella multocida*. Veterinary advice should be sought on the treatment and control of pneumonia. The most important factor for a successful outcome is to start the correct treatment as early as possible in the course of the disease and to treat for necessary period of time; by failing to do so, the calf may relapse with recurrent bouts of pneumonia. Prevention of pneumonia is better than treating outbreaks, and calves' resistance to infection is enhanced by ensuring good colostrum intake and nutrition, controlling scour and avoiding stress. If vaccination is prescribed, ensure vaccines are stored and used as recommended to ensure maximum efficacy. High risk periods for pneumonia outbreaks coincide with stress-inducing conditions, such as at grouping or mixing of groups, transport, weaning, dietary changes, or unfavourable weather. Rapid changes in temperature, as often seen in warm sunny days followed by cold nights, can be stressful especially for calves under 3 weeks of age. No matter what system is used for calf housing, to prevent pneumonia it is important that every effort is made to minimise stress, provide access to plenty of fresh, clean air, without draughts, and a clean, dry, well-bedded lying area.

iii. Calf Scour

Scour is still the most common health issue among young calves. It causes major financial losses to the Irish cattle industry, as well as stress and an increased workload for the farmer. Scours in the neonatal calf are caused by a variety of infectious agents including parasites, viruses and bacteria. When scour occurs, the mucosa of the intestines will be damaged which causes a loss of fluid and salts and poor absorption of nutrients, resulting in the calf becoming dehydrated. The most important principle for the treatment of the diarrhoeic calf is therefore the replacement of lost fluids (rehydration) and salts (electrolytes).

WHAT CAUSES SCOUR?

PARASITES	Cryptosporidia**
	Coccidia* (generally in calves older than 3 weeks)
VIRUSES	Rotavirus
	Coronavirus
BACTERIA	Salmonella**
	E. coli (only in calves under 5 days of age)

*Coccidia usually causes problem in calves slightly older (3 weeks onwards)

**Cryptosporidia and Salmonella may be zoonotic, therefore they are capable of causing disease in humans

Recommended Best Practice

- Removing the scouring calf from the group: This prevents infection from spreading to other calves, but it also facilitates control and handling.
- Rehydration: Fluids and electrolytes are best provided as electrolyte solutions that are given in additional feeds to the normal milk feeds e.g. at noon and late at night. You can safely give these solutions by stomach tube if the calf refuses or is unable to drink. Patience and care should be taken if using a stomach tube.
- Milk Feeding: The scouring calf needs as much milk as the healthy calf. It is not recommended to feed milk by stomach tube to calves after one day old as it leads to build up of acid in the developing rumen and damage to the rumen wall.
- Electrolyte solutions should not be added to milk, as it impedes the curdling of the milk in the calf stomach which is necessary for normal digestion. Milk should not be diluted with water.

Keeping calves on milk while they are scouring will not worsen or prolong diarrhoea and can aid in recovery. Milk withdrawal, however, can lead to loss of condition; therefore, the normal feeding regime should be maintained for dairy calves while beef calves should remain with their mothers. As long as calves are standing, drinking and properly hydrated, no further treatment is required. When calves are dehydrated, they need electrolytes in addition to normal milk feeding, separate water with electrolyte feeds during the day. **Antibiotics DO NOT work against the parasites and viruses that are the most common causes of calf scour.** If antibiotics are used when they are not needed, there is a chance they won't work if, in the future, the calf has an infection that requires antibiotic treatment. If calves are not responding to first aid, veterinary advice should be sought. When a calf is down, or is unable to rise unaided, not drinking and/or

their eyeballs are sunken, a veterinary practitioner should be called for further treatment. These calves will require intravenous fluids (i/v drip) to rehydrate them.

If calf scour is a problem in a herd, an investigation is best carried out by a veterinary practitioner to determine what infectious agent or agents (there may be more than one) are involved. The veterinarian will then advise on treatment and prevention measures for the herd.

c. Contingency Planning

Contingency plans for emergencies such as floods, storms, snow or drought, disease outbreaks (such as TB restriction), loss of labour or a family crisis, need to be in place to ensure the welfare of animals. While it is neither possible nor reasonable to put plans in place to deal with every potential problem, farms susceptible to extreme climatic conditions will benefit from contingency plans that help prevent the severe damage and welfare implications associated with extreme weather events. Farmers must also consider contingency plans in the event of disease restriction which may prevent them from moving calves off-farm.

Recommended Best Practice:

- Assess the risks of farms susceptibility to floods, storms and droughts and develop contingency plans for these events.
- Implement emergency management protocols and ensure all staff are familiar with emergency procedures.
- Ensure newly designed or renovated housing facilities are constructed to withstand severe weather conditions and facilitate evacuation in an emergency.
- Consider emergency management protocols when designing or renovating facilities.
- Develop a plan for evacuating calves in the event of an emergency. The plan should include consideration of emergency housing, transportation and personnel.
- Ensure the availability of good sources of suitable water, not dependent on rainfall and hold sufficient stored feed at accessible and safe sites.
- Install an effective alarm system for fire and power failure. Fire extinguishers should be available in all buildings.
- Ensure back-up generators are available and functional.
- Employ corrective measures in the event of stray voltage problems.
- Ensure electrical panels are not accessible to cattle.
- Ask for assistance, if needed, from local authorities or farm veterinarians.

d. Euthanasia

Unexpected and unforeseeable emergencies arise on dairy farms where calves experience severe pain and suffering that will become worse if they are not euthanised immediately. These calves must receive immediate veterinary attention and be humanely destroyed by a veterinarian or a licensed knackery operative.

Appendix I: Welfare of the hand reared calf

The following summarises the main aspects of S.I. 311 of 2010:

1. Materials used for the construction of calf accommodation and equipment with which calves may come into contact shall not be harmful to the calves. Those parts of the accommodation with which the animals come into contact shall be thoroughly cleansed and disinfected, using an approved disinfectant to prevent cross-infection and the build-up of disease-carrying organisms.
2. Electrical circuits and equipment shall be installed in accordance with the terms of the National Rules for Electrical Installation ET 101/1991 (2nd Edition) to avoid electrical shocks.
3. Insulation, heating and ventilation of the building shall ensure that the air circulation, dust level, temperature, relative air humidity and gas concentrations are kept within limits which are not harmful to the calves.
4. All automated or mechanical equipment essential for the calves' health and wellbeing shall be inspected at least once daily. Where defects are discovered, these shall be rectified immediately or, if this is impossible, appropriate steps shall be taken to safeguard the health and well-being of the calves until the defect has been rectified, notably by using alternative methods of feeding and maintaining a satisfactory environment.
5. Where an artificial ventilation system is used, provision shall be made for an appropriate back-up system to guarantee sufficient air renewal to preserve the health and well-being of the calves in the event of the failure of the system, and an alarm system, independent of the mains electricity supply, shall be provided to warn the owner or person in charge of the breakdown or in the event of fire. The alarm system shall be tested at a minimum once a month and maintained in proper working order.
6. Calves shall not be kept permanently in darkness. To meet their behavioural and physiological needs, the accommodation shall be well lit, by natural or artificial light, for at least 8 hours a day. Every source of artificial light shall be mounted so as not to cause discomfort to the calves. An adequate source of light shall be available to enable the calves to be properly inspected at any time.
7. All housed calves shall be inspected by the owner or the person responsible for the animals at least twice daily and calves kept outside shall be inspected at least once daily. Any calf, which appears to be ill or injured, shall be treated appropriately without delay and veterinary advice shall be obtained as soon as possible for any calf which is not responding to the stock-keepers care. Where necessary, sick or injured calves shall be isolated in adequate accommodation with dry, comfortable bedding.

8. The accommodation for calves must be constructed in such a way as to allow each calf to lie down, rest, stand up and groom itself without difficulty. No calf shall be confined in an individual pen after the age of eight weeks, unless a veterinarian certifies that its health or behaviour requires it to be isolated in order to receive treatment. The width of any individual pen for a calf shall be at least equal to the height of the calf at the withers, measured in the standing position, and the length shall be at least equal to the body length of the calf, measured from the tip of the nose to the caudal edge of the pin bone, multiplied by 1,1. For calves kept in groups, the unrestricted space allowance available to each calf shall be at least equal to 1.5 m² for each calf with a liveweight of less than 150 kg, at least equal to 1.7 m² for each calf with a liveweight of 150 kg or more but less than 220 kg and at least equal to 1.8 m² for each calf with a liveweight of 220 kg or more.
9. Calves shall not be tethered, with the exception of group-housed calves, which may be tethered for periods of not more than one hour at the time of feeding milk or milk substitute. Where tethers are used, they shall not cause injury to the calves and shall be inspected regularly and adjusted as necessary to ensure a comfortable fit. Each tether shall be designed to avoid the risk of strangulation or injury and to allow the calf to move in accordance with point 7.
10. Housing, pens, equipment and utensils for calves shall be properly cleaned and disinfected to prevent cross-infection and the build-up of disease carrying organisms. Faeces, urine and uneaten or spilt food shall be removed, and bedding changed as often as necessary to minimise smell and avoid attracting flies or rodents.
11. Floors shall be smooth but not slippery to prevent injury to the calves and so designed as not to cause injury or suffering to calves standing or lying on them.
12. Floors shall be suitable for the size and weight of the calves and form a rigid, even and stable surface. The lying area shall be comfortable, clean, and adequately drained and shall not adversely affect the calves. Appropriate bedding shall be provided for all calves less than two weeks old.
13. All calves shall be provided with an appropriate diet adapted to their age, weight and behavioural and physiological needs, to promote good health and welfare. To this end, their food shall contain sufficient iron to ensure an average blood haemoglobin level of at least 4.5 mmol/litre and a minimum daily ration of fibrous food shall be provided for each calf over two weeks old, the quantity being raised from 50 g to 250 g per day for calves from 8 to 20 weeks old. Calves shall not be muzzled.
14. All calves shall be fed at least twice a day. Where calves are housed in groups and not fed ad libitum or by automatic feeding system, each calf shall have access to the food at the same time as the others in the group.

15. All calves over two weeks of age shall have access to a sufficient quantity of fresh water or be able to satisfy their fluid intake needs by drinking other liquids. However, in hot weather conditions or for calves which are ill, fresh drinking water should be available at all times.
16. Feeding and watering equipment for calves shall be designed, constructed, placed and maintained so that contamination of feed and water is minimised. Equipment and fittings shall be designed and maintained in such a way as to minimise, as far as is practicable, the exposure of the calves to spills of feed or water, or to faeces and urine.
17. Calves shall be cared for by a sufficient number of suitably experienced personnel.
18. Up to 8 weeks of age calves may be kept in individual pens where they must have direct visual and tactile contact with other calves.

Appendix II: List of Legislation and Information Links associated with Animal Welfare.

In addition to the previous Appendix I: Welfare of the Hand Reared Calf, general rules are laid down in [Council Directive 98/58/EC](#). Also, there is a body of national and EU regulations governing general animal health and husbandry. A current list of relevant legislation is available here or from the Animal Health and Welfare Division of the Department of Agriculture Food and the Marine, Kildare Street, Dublin 2. animalwelfare@agriculture.gov.ie

- Animal Health and Welfare Act 2013:
<http://www.irishstatutebook.ie/eli/2013/act/15/enacted/en/html>
- S.I. No. 311/2010 - European Communities (Welfare of farmed animals) Regulations: 2010.
<http://www.irishstatutebook.ie/eli/2010/si/311/made/en/print>
- Animal Health Ireland link to Biosecurity Leaflets:
http://animalhealthireland.ie/?page_id=397
- Animal Health Ireland Colostrum Management:
<http://animalhealthireland.ie/?ahi-video=ahi-calf-health-emer-kennedy>
- Animal Health Ireland Calf Care Leaflets:
http://animalhealthireland.ie/?page_id=387
- Animal Health Ireland Calf Care Videos:
http://animalhealthireland.ie/?page_id=4346
- Farm Animal Welfare Advisory Council (FAWAC) Best Practice for the welfare of Animals During Transport:
<http://www.fawac.ie/media/fawac/content/publications/animalwelfare/BestPracticeWelfareAnimalsTransport.pdf>
- Health and Safety Authority - Code of Practice for preventing injury and Occupational ill Health in Agriculture:
https://www.hsa.ie/eng/Publications_and_Forms/Publications/Agriculture_and_Forestry/Code_of_Practice_for_Preventing_Injury_and_Occupational_Ill_Health_in_Agriculture.html
- Health and Safety Authority – Guidance on the Safe Handling of Cattle on Farms:
https://www.hsa.ie/eng/Publications_and_Forms/Publications/Agriculture_and_Forestry/Safe_Handling_of_Cattle_on_Farms.pdf
- List of approved disinfectants on DAFM Website:
<https://www.agriculture.gov.ie/animalhealthwelfare/diseasecontrol/disinfectants/>
- S.I. No. 127 of 2014 Animal Health and Welfare (Operations and Procedures)

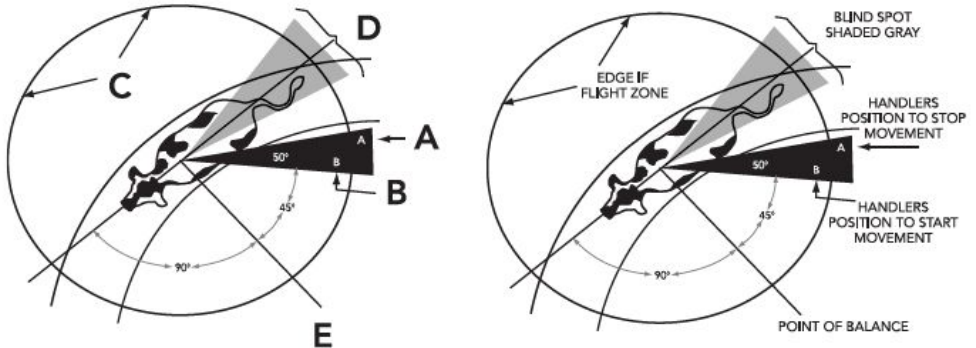
(No. 2) Regulations 2014:

<http://www.irishstatutebook.ie/eli/2014/si/127/made/en/pdf>

- Teagasc Calf Rearing Manual: <https://www.teagasc.ie/publications/2017/teagasc-calf-rearing-manual.php>
- Transport off farm legislation: <https://www.agriculture.gov.ie/animaltransport/>

Appendix III: Behavioural principles of animal handling

Stockpersons should be trained so that they understand the behavioural principles of animal handling (Figure 1).



To keep animals calm and move them easily, the handler should work on the edge of the flight zone (Figure 1 – C). He/she penetrates the flight zone to make the animal move and backs up if he/she wants the animal to stop moving. The handler should avoid the blind spot behind the animal's rear (D). If animals turn back and run past the handler while they are being driven down a drive alley in the stockyard, overly deep penetration of the flight zone (C) is a likely cause. The animals turn back in an attempt to get away from the handler. If the animals start to turn back, the handler should back up and increase the distance between him and the animals. Backing up must be done at the first indication of a turn back. If a group of animals balks at a smell or a shadow up ahead, be patient and wait for the leader to cross the shadow. The rest of the animals will follow. If cattle rear up in a crush, back away from them. Do not touch them or hit them. They are rearing in an attempt to increase the distance between themselves and the handler. They will usually settle down if you leave them alone.

The point of balance is at the animal's shoulder (Figure 1 – E). Animals will move forward if the handler stands behind the point of balance. They will back up if the handler stands in front of the point of balance. Many handlers make the mistake of standing in front of the point of balance while attempting to make an animal move forward in a chute. Groups of animals in a crush will often move forward without prodding when the handler walks past the point of balance in the opposite direction of

each animal in the chute. It is not necessary to prod every animal. If the animals are moving through the crush by themselves, leave them alone. Walking quickly past the point of balance at the animal's shoulder in the opposite direction as desired movement is an easy way to induce an animal to move forward.

The principle is to walk inside the flight zone in the opposite direction of desired movement and to return to the starting position by walking outside the flight zone. The animal has to be able to see you to make this movement pattern work. In chute (race) systems with completely solid sides you may need to make a small slit at animal eye level along the inner radius. In curved systems the handler should work along the inner radius and the outer radius should have a completely solid fence. In systems with catwalks alongside the chute the animals will be able to see you and the chute (race) sides should be completely solid.

Remove distractions – If animals refuse to move up a loading ramp or down an alley or into a milking parlour remove distractions that cause them to balk. Some common distractions are seeing people up ahead, reflections off puddles, vehicles parked near the chute, dogs, or a piece of chain hanging down. Painting the facility one colour to reduce contrast and installing solid fences on ramps and around pens will often improve animal movement. Solid sides improve movement because they prevent animals from seeing distractions outside the fence.

For further information please contact:

The Secretary
Farm Animal Welfare Advisory Council
Animal Health and Welfare Division
Agriculture House
Kildare Street
Dublin 2.

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