## Materials to Help Guide Producers towards Improving Cow Comfort on Their Farms

ACCOMODATION AND HOUSING - STALL DESIGN

* HOCK, KNEE AND NECK INJURIES

Condition of the hocks can be an important indicator of the abrasiveness of stall surface and cow comfort. Injury is usually the result of prolonged exposure to an abrasive stall surface. Injuries can also be associated with poor stall design and increased lying time in sick cows. Skin breakage provides an opportunity for infection to occur, which can lead to swelling, discomfort, and possibly lameness.

Knee health is an important indicator of the hardness of the stall floor and cow comfort. Injury is usually the result of prolonged exposure to a hard stall floor leading to swelling and skin breakage which provides an opportunity for infection to occur resulting in discomfort and possibly lameness.

Neck injury is an important indicator of whether the neck rail/chain in the stalls is at the correct height and that the feed is within easy reach. Neck injuries are usually the result of prolonged exposure to rubbing or hitting against the neck rail/chain or feed bunk rail/chain. Some other factors that can play a role in this type of injury are the cow’s size, the amount of bedding, the length of the neck chain, presence of electric trainers and whether the cow is used to being tied.

* STALL CONFIGURATION

Electric trainers may improve stall hygiene, but the proper placement of the trainer is imperative for it to work effectively and to avoid injuries. Electric trainers should not touch the animals when they are standing undisturbed in their stalls.

A mature Canadian Holstein (>700 kg) requires >76 cm of open forward space for lunging motion. Impaired lunge space may result in improper movements when getting up that could lead to injuries and lameness. All cows should have adequate forward space to lunge properly while motioning to stand up.

A mature Canadian Holstein cow (>700 kg) needs 183 cm of bed length in order to lie freely in their stall. Shorter stalls may result in decreased lying time, increased hoof lesions, leg injuries and lameness. All cows should have a bed length that fits them properly.

A mature Canadian Holstein cow (> 700 kg) requires 137 cm of stall width in order to rest comfortably. Narrow stalls reduce lying time and may increase lameness. All cows should have a stall wide enough to fit them properly.

ACCOMODATION AND HOUSING - STALL MANAGEMENT

* STALL BASE/ STALL BEDDING

Concrete platforms or hard rubber mats with little bedding (< 2 cm) reduce lying time to below 11 h/d while cows housed on mattress, sand or deep bedded-concrete/rubber may lie down for 12 h/d. Concrete platforms or hard rubber with little bedding (< 2 cm) increase hock and knee injuries. A lower incidence of hock injuries has been found in herds with mattresses when bedding is added more frequently to the stalls. This is likely because the stalls are not as wet and the stall base becomes less abrasive with more bedding.

Research into cow comfort has shown that dry bedding is important to cows. Wet bedding reduces lying time more than any other feature of stall design. Maintaining clean and dry stalls will improve cow comfort and encourage cows to lay down longer while keeping the cows cleaner. Cows with cleaner udders will have a decreased chance of environmental mastitis.

When comparing the type of stall base, research showed that cows tend to prefer sand over rubber mats, mattresses, or concrete when given a choice. Sand bedding has been shown to improve cleanliness, amount of skin lesions on hocks and knees, and number of lame cows. All of these lead to improved welfare for the cow and, as a result, higher production rates can be achieved with sand-bedded stalls when compared to other stall surfaces. In general, using deep bedding, regardless of the type, helps to lower the number of hock injuries in dairy cattle.

* STALL/BEDDING MANAGEMENT

Cow cleanliness is an important indicator of cow comfort. Frequent and strategic cleaning of the alleys and stalls will reduce the amount of manure on cows and reduce the amount of manure tracked into the stalls. On the other hand, dirty legs point to manure splashing in the alleys; dirty flanks and udders are a result of animals lying in dirty and/or poorly bedded stalls.

Cows will not lie down as long when provided with wet stalls. Cows with large areas of dried caked manure indicate a long-term build-up of manure and highlight weaknesses in the cleaning routine of the alleys and/or stalls.

In a free-stall facility, stocking density is also an important factor to consider as part of cow welfare. Providing enough stalls per cow helps decrease stress on the cows by reducing competition for lying space, as a result, cows will spend more time lying down. Providing enough stalls for each cow may encourage cows to stand at the feed bunk after milking, allowing teat-ends to close before they lay down and decreasing the risk of mastitis.

FEED AND WATER

* BODY CONDITION SCORING

Body condition scoring is a technique for assessing the thickness of fat cover of dairy cattle. For dairy cattle, the crucial periods are at calving and during early lactation. Cows should be at an ideal body condition score (BCS) at dry off (3.25 to 3.75) and should be fed to maintain this condition until calving. Both over-conditioned and under-conditioned cattle are of concern when considering the wellbeing of the animal. If cows are over-conditioned during the dry period, they can be at an increased risk of becoming lame after calving. These heavier cows are also more prone to developing digital dermatitis (a.k.a hairy heel wart) compared to ideally conditioned cows. A cow’s hoof contains a fat pad known as the digital cushion. This cushion provides support to the hoof by absorbing the force that is placed on the hoof each time the cow takes a step. A cow with a low body condition is at higher risk of lameness because the digital cushion is thinner and therefore, not supporting the hoof as it should be. These under-conditioned cows have been shown to be at a higher risk of sole ulcers and white line disease.

Post calving (calving to 120 days), cows can be expected to lose 0.5 to 1 unit of BCS. Cows should not lose more than 1 unit of BCS at any time. BCS should remain constant or begin to increase during mid-lactation. During late lactation, cows should gain back the BCS lost during the post-calving period. Producers must take corrective action for animals at a BCS of 2 or lower.

* NUTRITION AND FEED MANAGEMENT

Correct feed management is necessary to ensure good health and welfare. Cows are motivated to perform the same activity at the same time (e.g., feed, rest, ruminate). Cows also prefer to eat during daylight hours. Increased feeding frequency (at least twice per day) has been found to reduce the amount of total mixed ration (TMR) sorting that occurs and allows subordinate cows to access feed more often. Feeding them more frequently can encourage them to consume more feed throughout the day as well. Feed management programs that consider such behavioural needs are likely to reduce stress and aggressive behaviours within a herd, and have a positive impact on herd health and productivity.

HEALTH AND WELFARE MANAGEMENT

* LAMENESS

Lameness in dairy cattle is a significant welfare problem indicating pain. Lame cows alter their behaviour to reduce bearing weight on the affected limb.

Lameness among dairy cows is widely recognized as one of the most serious (and costly) animal welfare issues in the dairy industry. Lameness results in decreased mobility, reduced Dry Matter Intake (DMI), decreased production, impaired reproduction, debilitated cows, and early culling. Lameness can be caused by many different factors including genetics, age of the cow, production level, stage of lactation and infectious diseases but the majority of problems are related to nutrition and the environment that the cow lives in. Prompt recognition, diagnosis, and early treatment minimize animal welfare concerns and allow the cow to produce to her potential. Lame cows must be diagnosed early and either treated, culled or euthanized.

CLAW HEALTH/HOOF-TRIMMING

Claw trimming is an important tool to prevent and treat lameness and should be a part of the overall claw-health program. It has been shown that regular hoof-trimming is essential for early detection of subclinical lameness in dairy cows. By detecting subclinical lameness earlier, a treatment plan can be implemented before the problem progresses and the cow becomes severely lame.

Hoof problems can also be prevented by providing a clean environment for the cows to stand. This can be achieved by increasing the amount of times alleys are scraped down during the day. Providing cows with a softer surface to stand on, such as rubber, can help decrease strain that is placed on their feet and legs.

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