

DAIRY COW COMFORT



BASICS

OVERVIEW

- Ongoing research has shown that elements of stall design, bedding, and overall “comfort” of the dairy cow affects individual performance, in milk production and reproduction, as well as cow health, with specific effects on the development of lameness and mastitis. This chapter will assist veterinarians in investigating cow comfort in a confinement/freestall dairy farm.

SIGNS OF POOR COMFORT

Herd

- Low pregnancy rates and/or estrus detection rates
- Decreased milk production
- High incidence of lameness (>10% of the herd)
- Decreased lying times (Goal is at least 10-11 hours/day)

Individual Cows

- Unusual cow behavior—dog sitting, lying backwards or diagonally in the stall
- Perching—Cows stand half in and half out of stalls
- Greater than 15% of cows standing in the stalls
- Cows are observed bumping stall dividers or neck rails when they lay down or get up and/or shiny spots are seen on stall parts.
- Cows lie off edge of stalls.
- Cows are dirty or stalls are dirty.
- Cows lie in the alleys/prefer the dirt lot.
- Cows struggle to get up and out of the stalls.
- Cows dig out the bedding in the stalls.
- Teat trauma
- Hock lesions and swellings
- Swollen tuber ischii
- Carpal hygromas

CAUSES AND RISK FACTORS

- Overstocking—in a 100% free-stall barn, about 125 square feet per cow is required, and a stall for every cow in the pen.
- Poor stall design
- Poor barn design—“dead-end” alleys decrease the ability of cows to utilize stalls on the other side of the barn; Poor airflow in some parts of the barn will decrease usage of stalls in that area. Design barns to minimize dead spots – areas with no measurable airflow.

- Inadequate cooling – cows may bunch in the summer months from poor cooling in certain areas of the barn or fly nuisance.
- Direct sunlight into stalls may make them unusable at various times of day.



DIAGNOSIS

- Calculate comfort or stall-use indices:
 - Proportion eligible lying (“stall-use index”) = total number lying in free stalls divided by the total number of cows not eating during that time period; goal is 85%.
 - Cow comfort index = number observed lying in stalls divided by the total number either lying or standing in a stall for that time period; goal is 90%.
- The optimal time for assessing the maximum proportion of cows lying down is about one hour after their return from the milking parlor. The free stalls should be assessed at various times of the day to determine stall usage.
- Environmental temperature (particularly if there is direct sun on any stall beds) and management activities will affect the proportion of cows utilizing the stalls.

Freestall Investigation Guidelines

Need to specifically evaluate stalls with these things in mind:

- Adequacy of the surface cushion
- A defined resting area of appropriate size related to the type of animal
- Adequate room for lunging and an unobstructed “bob zone”
- Adequate height below and behind the neck-rail to rise without hindrance
- A curb height no higher than 8 inches

Surface Cushion—the Most Important Key to Cow Comfort

- Is there about 6 inches of a conforming bedding material?
- Does it pass the knee test? Knees should be clean and dry after dropping to the surface cushion.
- Bed space—Adequate length and width for resting body.
 - Is the total length of the stall (in inches) = $0.0405 * (\text{lb BWt}) + 41$?
 - Do the cows’ bodies hang over the ends of the stalls? If so, then stalls are too short.
 - Do the cows defecate in the backs of the stalls? If so, then stalls are too long or the cows are not being positioned correctly in the stall.
 - Measure the width of the stall (center to center of the dividers). Is the width of the stall (in inches) = $0.018 * (\text{lb BWt}) + 21.9$? Aim for stalls to be 46-54 inches wide.
 - Do the cows lie diagonally in the stalls? This could be from stalls being too short or a “social obstruction” present where the cows do not like to be face to face with a more dominant cow. Head-to-head stalls should be built on an 18-foot platform
- Lunge space—The space in front of the stall where the cow pushes her head forward when she rises. Is the brisket board no higher than 4–6 inches above the bed surface? Can the cow lunge forward? Or, can the cow lunge to the side to get up? Is there more than 24 inches in the front of the stall?
- Bob space—The lowest point at which the cow places her chin when she lunges forward before rising. Is there a chin obstruction at the front of the stall? The cow should not hit her chin on any obstruction when she lunges forward before rising nor should she choke when lowering her head to rise.

- Neck rail—Neck rails are used only to guide the cow regarding where to lie down and where to stand up.
 - Are the neck rails shiny?
 - Are the cows rubbing the neck rail when rising? If so, the neck rail likely is too low.
 - Is the neck rail located above the brisket board?
 - Is the neck rail placed about 66 inches from the back curb? This is the appropriate position.
 - Is the height to the bottom of the neck rail (in inches) = $0.0136 * (\text{lb BWt}) + 26.4$? 48–50 inches for Holstein cows
- Curb—Curb height should be 8 inches or less.
- Alleys—What is the surface of the alleys in the alleyway? What is the surface of the alleys in the barn? Do these provide proper traction? There is some indication that placing rubber mats or belting in the alleys will reduce foot lesions. Alleyways may need grooving to ensure proper footing for cows and employees.

MANAGEMENT

- Provide adequate space per cow in the barn and a stall for every cow.
- Stall remediation—open lunge space, change stall widths, remove obstructions, and remove brisket board if stalls are too short.
- Provide plenty of bedding for surface cushion. Bedding should be groomed regularly to remove any wet areas, agitate the bedding material for better drying, and fill holes in the bed surface. Adequate bedding is necessary for proper lying time.
- Heat abatement—heat stress will affect feed intake, milk production, estrous behavior, and lying behavior.
- Alleys—rubber mats in the alleys can relieve the concussive stress on cattle feet from concrete.



MISCELLANEOUS

SEE ALSO

Dairy Cattle Behavior (www.fiveminutevet.com/ruminant)

Dairy Economics (www.fiveminutevet.com/ruminant)

Dairy Heifer Management Program (www.fiveminutevet.com/ruminant)

Dairy Nutrition Ration Guidelines for Milking and Dry Cows
(www.fiveminutevet.com/ruminant)

Heat Stress

ABBREVIATIONS

- BWt = body weight

Suggested Reading

Nordlund, K., Cook, N. B. *A flowchart for evaluating dairy cow freestalls.*
https://www.vetmed.wisc.edu/dms/fapm/fapmtools/5house/2a-Freestall_Paper.pdf

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Von Keyserlingk, M.A., Barrientos, A., Ito, K., Galo, E., Weary, D.M. 2012. Benchmarking cow comfort on North American freestall dairies: Lameness, leg injuries, lying time, facility design, and management for high-producing Holstein dairy cows. *J Dairy Sci* 95:7399-7408.

Weary, D. M., Tazskun, I. 2000. Hock lesions and free-stall design. *J Dairy Sci* 83:697–702.

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Acknowledgment The author and book editors acknowledge the prior contribution of Dale Moore.