

Cattle Bunching on Dairy Farms: Causes and Solutions

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Bunching of animals is a common problem on dairy farms during summer months. Cows in freestall barns sometimes congregate together in one part of the barn, with ample free space that is not being utilized. Youngstock in group housing and cattle in lots or pastures may also exhibit this behavior. It can be a very frustrating problem as it is often difficult to determine what is causing cattle to bunch and what can be done to prevent it.

The simple answer is that bunching is a natural response to stress and alleviating that stress will help prevent bunching. Stressful conditions can result in a herding instinct that causes cattle to group together, even though the resulting bunching may be in a less comfortable area of the barn and often further increases the level of stress (Figure 1). Attempts to disperse the group are likely to fail and may cause additional stress to animals and frustration to their caretakers. The underlying issue causing the stress must be addressed to prevent bunching.



Figure 1. Cows bunching in a slightly darker part of the barn with slower airflow during hot conditions.

Bunching is thought to be caused by one or more of these four interrelated issues: heat stress, biting flies, lack of fresh air, and light avoidance. Management strategies must be implemented to minimize the frequency of cattle bunching together in a group. If cattle favor one area more than another, try to determine why and extend that benefit to the other areas of the barn, lot, or pasture.

Assessing the causes of bunching

Assessing the causes of bunching starts with observing the cattle and asking a series of questions. When and where does the bunching occur? Is there a noticeable timing or location pattern or is it more random? Once you have a general sense of the bunching behavior, answering a more specific set of questions can help narrow down the cause and point towards potential solutions.

Heat stress

Heat stress is a common culprit of cattle bunching. If bunching occurs during hot weather, less air will move through the group of animals, making them even more susceptible to heat stress. To determine if heat stress may be the cause of bunching, assess the conditions in the barn with a series of questions. Do cows bunch more as temperature or Temperature Humidity Index (THI) increases? Do they disperse once the temperature drops below a certain point? If the answer to these questions is yes, heat stress is likely playing a role in the bunching behavior.

Solutions

To improve cow cooling in freestall barns, it is essential to address the critical areas where heat stress occurs. At a minimum, fans must be located and spaced to provide adequate airspeed to sufficiently cool the cows in both the cow resting area and the holding area. In the cow resting area, aim for a minimum airspeed of for 200 ft/min or 2.25 mph measured at head height as the cow is lying down. Take measurements in several locations and identify any dead spots or areas with poor airflow. These typically occur near crossover alleys, divider walls, and other obstructions. Wind speed, temperature, humidity, and other measurements can be made with handheld devices starting at around \$150. Check with your local Extension service, veterinarian, or agribusiness representative to see if they provide devices or assistance.

If recirculation fans are used, they should be spaced 24 to 30 ft apart over every row of stalls and angled downward to point toward the stall surface underneath the next fan in the row. Additional fans can be located to address areas with low airspeed as needed. Large diameter recirculation fans (72") can be spaced up to 40 ft apart and should have louvers to help distribute air more evenly across the stall surface. Dirty fans can lose up to 40% of their airflow capacity. Make sure existing fans are clean and well maintained and drive belts are tight to ensure maximum airflow. This is especially important in mechanically ventilated barns where all airflow is provided by fans.

Providing cooling in the holding area is critical for heat stress abatement. Cows under heat stress in the holding area may have difficulty cooling down later on and may exhibit bunching behavior as a result. Limit time spent in the holding area and provide sufficient fan capacity. Holding pen ventilation rate should be about 1,000 cubic feet per minute per cow. Holding pen sprinklers should be capable of providing at least 0.03 gallons per minute (gpm) per square foot of area. Holding pen sprinkler timers should be set to provide 1 minute of wetting followed by 6 minutes off. Directly wetting the cow is more effective when combined with fans because air velocity increases the rate of evaporation. Sprinklers in the holding area should never be used without mechanical ventilation because the increase in THI can cause severe heat stress.

Fans and sprinklers along the feed bunk can provide additional cooling benefit but avoid wetting stalls and feed if possible. It is important to understand that the cooling effect from sprinklers comes from letting water evaporate off the cow. Continuous wetting is counterproductive because it does not allow time for evaporation to occur. Sprinklers need to be on a timer system

with programmable on-off periods. Feed alley sprinkler systems are typically designed with nozzles and piping sized to provide around 0.03 gpm per square foot of wetted area per cycle. The recommended cycle is 0.5 to 1.5 minutes on (long enough to soak to the skin), followed by 10 to 15 minutes off to allow for evaporation. These cycles can be shortened to 5 minutes off as temperatures increase, but the cow still needs time to dry to get the cooling benefit.



Figure 2. A combination of recirculation fans and sprinklers to provide cow cooling.

In both the holding area and feed alley it is important to use sprinkler nozzles that provide a large droplet size to ensure that cows are wetted through to the skin. Avoid misting systems as they create small droplets that can cause air to lock between the hair and the skin and prevent evaporation. Low pressure systems with pressure regulators to keep water line pressure below 20 pounds per square inch work best for producing larger droplets.

Access to plenty of clean fresh water is a must regardless of your type of production system. Water helps remove body heat via cooling the digestive system, respiration, and sweating. Cows consume up to 50% of daily water intake within an hour of milking so providing fresh clean water at the parlor or barn exit is a good strategy. For pasture-based systems try to provide 40 to 50 ft² of shade per cow on hotter days. Consider moveable shade systems with a north-south orientation to prevent wet areas from developing underneath.

Lack of fresh air

Lack of fresh air can cause stress and is directly linked to poor ventilation. The strategies outlined above to provide additional ventilation will also help address concerns with fresh air. There are additional questions you can ask to determine if lack of fresh air may be contributing to bunching. In mechanically ventilated barns, is the fresh air intake area adequately sized? Do cows bunch near fresh air inlets or areas with faster moving air? In naturally ventilated or hybrid ventilation barns, do cows bunch more on days with slower wind speeds?

Solutions

It is critical that the natural or mechanical ventilation system brings fresh air into the barn rather than just recirculating stale air. Bringing in fresh air is the only way to displace hot, humid, stale air from the barn. In mechanically ventilated barns (tunnel or cross-ventilation), measure airspeed coming into the inlet area. Inlet airspeed should be 500 to 800 ft/min (5.7 to 9 mph) to ensure good air mixing inside the barn. Adjust inlet area to achieve proper airspeed and/or add

fan capacity to bring more fresh air into the barn. In natural or hybrid ventilated barns with open sides, airspeed will vary. Make sure at least half of the sidewall area is open on both sides of the barn. In either case, a fogger or smoke stick can be used to determine airflow patterns and detect dead spots.

Flies

Flies are another common culprit of cattle bunching. Stable flies, horn flies, and face flies are common fly pests on dairy farms. What type of flies do you have? Which fly avoidance behaviors are cattle exhibiting? Observing cattle behavior can help determine which type of flies may be causing the problem and guide strategies for remedying fly problems that lead to bunching.

Stable flies

Stable flies are blood feeders and are a common pest in feedlots and confined facilities. They are about ¼ inch long and prefer cattle's legs and bellies and can deliver a painful bite. Cattle often bunch with their heads to the center and their tails to the outside of the bunch to protect themselves from stable fly bites. Cattle at the center of the bunch may be somewhat protected because the number of flies per animal decreases with increasing group size. Foot stomping is a common symptom with stable flies, but cattle may also flick their tails and twitch their skin in response.

Horse flies and deer flies

Horse flies and deer flies are blood feeders that also have a painful bite. They are much larger than stable flies and typically feed on the back, neck, and sides of cattle. The larval stage develops in or near water so these flies are more commonly found near natural water sources.

Horn flies

Horn flies spend most of their time on cattle and generally occur as small clouds of flies over the animals back. They tend to move down cattle's sides as temperatures rise throughout the day. Horn flies are a common pest in pastured cattle and cause cattle to flick their tails over their backs, throw their heads over their shoulders, and can cause bunching.

Face flies and houseflies

Face flies and house flies look almost identical. They feed on secretions from pre-existing openings or wounds but do not bite. Face flies congregate around eyes whereas houseflies tend to gather around nostrils and mouth. These flies only stay on cattle for short periods of time. Cattle react to face flies by flapping ears and shaking their heads from side to side. Houseflies generally cause little harm or defensive behavior.

Solutions

If cows are exhibiting fly avoidance behaviors, take steps to reduce fly population. Feeding wet distillers grain or molasses, having crops on multiple sides of the facility, and proximity of manure lagoons have all been associated with greater bunching due to stable flies. Piles of moist, decaying feed are common areas where stable flies lay their eggs and where the larvae develop, whereas face flies lay their eggs in fresh manure. The most effective method for reducing stable fly populations is elimination of breeding areas. Emptying the manure lagoon, general fly control, and removal of vegetation around the barn can help reduce fly populations. Keep wet or spoiled feed away from the barn, clean up spilled feed, address areas with water ponding, and maintain general facility cleanliness to reduce breeding areas for flies.

Premises spraying can be an effective strategy. Use of pour-on insecticides or fly sprays may also help resolve the situation. Fly tags are another option commonly used for grazing animals. Horn flies can typically be controlled by applying insecticide to the body. However, the short time stable flies and face flies spend on the cattle makes control with insecticides difficult. Decreased fly populations have been observed on dairies using in-feed chitin inhibitors. Always check the label for restrictions before using any insecticide or other fly control product. Cattle in outdoor lots or pastures will exhibit many of the same fly avoidance behaviors and many of the same strategies noted above can be used to reduce heat stress and control fly populations to prevent bunching.

Light avoidance

Bright light by itself will not cause cattle to seek out darker areas. Rather, the avoidance of light is a secondary response to other stressors. It is thought that cattle equate 'light' with 'hot' due to their natural grazing instinct. When stressed, cows will seek faster air movement and/or darker areas of the barn even though it may be a hotter area. Observe cattle and the barn environment over time. Is light distribution even throughout the barn, or are some areas darker than others? Are cows bunching in darkened areas as the sun moves, or do they always bunch in the same area? Do cows still bunch after sundown? Answering these questions can help to determine if cattle are displaying light avoidance behavior.

Solutions

To prevent bunching in darker areas of the barn, implement heat abatement strategies, control flies, and limit the variability in light intensity within the barn. If cattle bunch in darker areas during the day to avoid the sun, light intensity variation can be limited by closing the curtains on the brighter side of the barn (starting from the top down) or by investing in shade cloth blinds (Figure 3). If possible, angle shade cloth away from the sidewall toward the bottom or leave a gap at the bottom to minimize air blockage. It may be necessary to add additional mechanical ventilation to ensure adequate airspeed in the barn if sidewalls are shaded or closed.



Figure 3. Shade cloth to prevent direct sunlight from penetrating into the barn. Photos courtesy the University of Wisconsin-Madison Dairyland Initiative.

Transparent sidewall or end wall panels will let more light in during the summer and increase the variability in light intensity throughout the barn. Avoid these or cover them with shade cloth if they appear to be causing bunching problems. If cattle still bunch in darker areas after sundown but before the lights turn off, clean light fixtures and consider adding additional lighting in darker areas of the barn to ensure that artificial lighting is evenly distributed.

Summary

Careful observation of cattle behavior can point towards solutions to cattle bunching. Attempting to disperse bunched cattle will only add additional stress to both cattle and their caretakers. Bunching is a natural response to stress and can only be remedied by addressing the underlying issues causing the stress. Implement heat abatement strategies, provide plenty of fresh air and water, control fly populations, and reduce variation in light intensity to reduce stress and prevent cattle bunching.

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