

Strategic Farmstead Planning

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Summer heat abatement

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It seems a little antithetical to talk about heat abatement strategies when there's a blizzard rolling through the upper Midwest, and soon the Northeast. Temperatures are falling, and more white stuff is flying past the window.

However, crop work hasn't started, and there is time to order any needed parts before temperatures rise.

The symptoms of heat stress usually show up as increased respiratory rate, body temperature, reduced feed intake, as well as reduced productive and reproductive performance. Moreover, the effects of excessive heat usually come back to haunt us as an increased incidence of lameness about two months after the fact due to extended standing times and rumen acidosis from slug feeding.

Praemonitus praemunitus

Which is Latin for "forewarned is forearmed." We know it's going to get hot. We know that dairy cows are going to be crowded into holding areas or close-quartered stall barns at milking time. We know a lactating dairy cow will produce upwards of 4,500 BTU's/ hour, so now is the time to begin planning and implementing a strategy to combat heat stress.

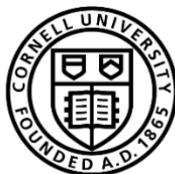
1. Maintain what's existing – Turn off and lockout the proper circuits at the breaker

box then go over every fan blade, motor and thermostat. Built-up dirt and dust should be removed from the blades and motors with a stiff bristle brush. This will improve efficiency and prolong motor life. The name plate on the motor under the heading "Enclosure" is likely labeled "TEFC". This stands for "Totally Enclosed, Fan Cooled" and means that the motor enclosure (housing) is sealed against the elements and is cooled by the air passing over (versus through) the motor. If the motor is encrusted with dust, dirt, cattle hair, etc. it can't be cooled by the air passing over it and may lead to premature failure of the bearings, bushings, and /or brushes. Motor and fan mounts should be tightened at this time, too.

Thermostats, especially the sensor coils, need to be clean. Like the motor, if it too is encrusted, it won't be as responsive to temperature changes resulting in excessive heat build-up in the facility before the fans engage. An old toothbrush is great for this. It can get into tight places and loosen any build-up. It may be helpful to remove the cover and blow out any cobwebs inside. Cans of compressed air for electronics work well.

2. Clean the inlets – A Coke bottle can't be ventilated. For an exchange of air, fresh air must be able to get in and stale air must be able to get out. If one or the other is missing or compromised the exchange won't happen.

Freestalls usually have large curtain sidewalls, open ends and an open ridge, so ventilation



can happen naturally – warm air rises; cooler, fresher air replaces it. In tunnel ventilated systems, or stall barns using exhaust fans, the inlets need to be clean and properly sized.

3. Placement – Ideally, exhaust fans should be placed on the leeward side (away from prevailing wind) of the building – work with nature instead of against it. Circulation fans should be placed over feed alleys and stall sections at a height that it won't be hit by cattle or equipment – usually about eight feet to the bottom of the fan. This may not be possible in stall barns, so fans should be enclosed by a grille. These fans should be tilted down. You won't need a protractor for this. Just aim the fan at the floor or stall bed directly below the next fan. Spacing of the fans should be such that you can maintain an air velocity of 440 feet per minute (about five miles per hour). You can check this with a small wind meter used for crop spraying.

In the holding area maintain the same height as the circulation fans but tilt the fans down 30 degrees. Because of the close quarters, however, you will need to provide a minimum of 1,000 cfm of fan capacity per cow (roughly equal to one 36-inch fan for every 10 cows).

4. Just add water – If you already have sprinklers or misters, the nozzles may require service as well. The hard water frequently found in New York will leave hard mineral deposits on the nozzles that may eventually plug it or at least prevent it from properly atomizing the water droplets. Just like on the crop sprayer, remove the nozzles and open the supply valve to flush the system. (Just don't get feed or stall beds wet).

A dilute acid solution will help remove deposits from the nozzles. Since the nozzles are more than likely to be made of brass a full-strength acid bath may cause pitting and / or change the size and shape of the orifice. You may use standard dairy acid diluted to 25 percent or less (three parts water: one part acid).

White vinegar straight from the bottle is usually mild enough but always use gloves and protective eyewear when handling any of these compounds. A bronze or stainless-steel detail brush from the local auto parts store can help remove even the most stubborn deposits. Rinse well and re-install. Don't forget to check the timer, pressure regulator, and line filter (if applicable).

In the holding area the soaker nozzles should provide one gallon per 150 feet squared per one minute cycle – equal to a 25 gallon per hour rating. A typical on:off cycle is 1:5 or 2:10. However, this can vary as the temperature rises and falls.

75 - 82° F once every 15 minutes (1:15)

83 - 87° F once every 10 minutes (1:10)

>87° F once every five minutes (1:5)

5. Water, water everywhere – And while we're on the subject, make sure clean water is available EVERYWHERE – in the barn, out in the pasture and near the return alley, if possible. If you're using a water jacket or plate pre-cooler, direct the outflowing water to a tank or trough near the parlor exit (be careful not to compromise cow flow). Cows exiting the parlor may have been away from water for 30 to 60 minutes and will really tank up on water that has had the chill taken off. Moreover, this slightly warmer water doesn't seem to have quite the chilling effect on the rumen bugs as water straight out of the plumbing system. Lastly, if tanks in the barn or out on pasture look more like a failed science experiment than the elixir of life, it's probably time to dump, drain and scrub them with a little detergent and plenty of elbow grease.