Impact of heat stress and abatement strategies for calves

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Calves under three weeks of age have a thermal neutral zone (TNZ) between 59 to 78°F. Below this zone they begin to experience cold stress, and above this zone they experience heat stress. Calves and heifers over three weeks of age begin to experience heat stress at 70°F.

Impact of heat stress on calves:

Energy requirements

Similar to lactating cattle, heat stress causes a decrease in feed intake. However, heat stress also causes an increase in energy requirements due to increased respiration and metabolic rate.

Immune system weakened

Energy that was supposed to go towards supporting the immune system is shifted to respiration. Cortisol (the “stress” hormone) is also increased with heat stress, leading to a weakened immune response.

Reduced growth rates

Energy for growth is shifted towards respiration.

Water intake increase

Calves will (and need to) consume 1 to 2 gallons of water/day, this value increases as the temperature climbs. This is water that is separate from what is provided in the milk/milk replacer. Inadequate water intake can lead to dehydration and death.

Heat stress abatement strategies

Shade: Make sure calves have access to a shaded area and are never in direct sunlight. Hutches can be realigned to capture shade and the prevailing winds, or a temporary shade canopy can be constructed.

Timing:

Increased body temperature from heat stress can lead to a compromised immune system. Perform potentially stressful activities (moving, grouping, vaccinating and dehorning) in the early morning when it is still cool.

Fresh & Clean:

Feed or bedding is important!

Feed – Keep starter and water fresh. Calves eat more starter when it is cool out (6:00 pm to 6:00 am). Provide fresh starter in every evening (to prevent spoilage) instead of the morning. Fresh, clean and cool water should be provided throughout the day. Make sure you clean feed, water and milk buckets regularly to prevent bacterial growth.

Bedding – bedding loaded with manure or urine not only heats up, but also attracts flies. Keep it clean to keep it cool.

WATER: Heat stressed calves can drink 3 to 6 gallons/day. Providing fresh, clean and cool water helps cool the calf, reducing the effects of heat stress.

Feeding Frequency – Feed calves in the early morning and late afternoon to prevent peak temperatures coinciding with digestion peaks. Increasing feeding frequency stimulates starter, thus hopefully preventing a decrease in feed intake that can lead to additional negative performance parameters.

Bedding:

Sand makes comfortable and cool surfaces in hot weather. Try to avoid straw bedding during summer months as it holds more heat and will attract flies.

Electrolytes:

Calves lose water and electrolytes through panting and sweating thus leading to dehydration. In addition to water, consider adding a mid-day electrolyte feeding to calves. If calves exhibit signs of dehydration, they have likely been dehydrated for 6 or more hours, and you should administer oral electrolytes immediately.

Fly Control:

In addition to heat during the summer, calves are also a hot spot for flies. Weakened immune systems in combination with the diseases that flies can carry could lead to disaster. Talk with your nutritionist about feeding a milk replacer or starter that contains a fly control product. Keep calf pens clean and dry, and feed dry and fresh to reduce fly populations.

Breeze:

Whether you can capitalize on the natural breeze, or create one with fans, it will keep calves cool, the area dry and discourage flies. Hutches can be elevated on one side to create a “tip”. This leads to increased ventilation and cooler internal hutch temperatures.

Heat Stress Abatement Strategies continued:

During the summer there’s lots to get done on a farm. Everyone (cows and people) are hot and tired. Calves are often easily overlooked at the end of a long day; however, this can cost you.

Decreased feed intake, growth and weakened immune systems can lead to increased treatment costs, deaths and cull rates, all impacting your bottom line.

Include these heat stress abatement strategies into the normal management protocols on the farm and reduce one potential headache.
Please Note: Meetings are subject to cancellation due to insufficient registration and/or weather conditions. Please register so we can contact you if meetings are canceled.

<table>
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<tr>
<th>Event Title</th>
<th>Details</th>
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<tr>
<td>Orchard Hedging Demonstration</td>
<td>Earlier this spring we had an orchard platform “working seminar” demonstration orchestrated by Dr. Terence Robinson at the Orchard systems trial. We saw firsthand how Platforms can better position workers to complete a range of tasks in high-density orchards. We continue our profile of specialized mechanized equipment that can expedite orchard tasks and free labor to other tasks. We will now demonstrate a tree hedging apparatus that mounted on the front end of an orchard tractor. Dr. Robinson is transporting both the tractor and the hedger from Geneva for this demonstration. We hope you can join us for this look at the shape of mechanized practices to come.</td>
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<tr>
<td>Got Flies? IPM Fly Control for Dairy Barns</td>
<td>Cornell Cooperative Extension of Clinton County will offer a two-hour workshop discussing methods of controlling flies that affect dairy cattle in barns. Tuesday, August 7, from 1pm to 3 pm. Ken Wise, Eastern New York Integrated Pest Management Specialist, will be on hand to lead the discussion concerning methods of managing and control of biting insects in barns. Both conventional and organic methods will be covered. This will provide an overview of fly management issues and include a walkabout to illustrate fly management opportunities. 2 Pesticide Applicator credits will be given for category 1b, 10, 31. Anyone with livestock or dairy cattle in barns is invited to attend. The meeting will begin at Dimock farm located on Route 22b in Peru. For more information and to register, call Pete Hagar at (518)561-7450 or email <a href="mailto:phh7@cornell.edu">phh7@cornell.edu</a>.</td>
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<td>Christmas Tree Pest Management</td>
<td>Establishing a Christmas Tree plantation and pest management considerations. Join Cornell Ornamentals specialist Betsy Lamb for a field meeting at the Jim Gonyo Tree Farm at 7256 Route 22, West Chazy. 6PM</td>
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<td>Late Summer Pasture Walk and Grazing Discussion</td>
<td>Hagar Hill Beef Farm in Schuyler Falls. 1374 Rt 22B. We plan to walk the pastures, view the forages and review some pasture initiatives implemented for improving forage growth in a planned rotational grazing system. Discussion on techniques used, soil quality, species composition, weeds, economics, etc. To register, contact CCE Clinton at 561-7450 or email <a href="mailto:phh7@cornell.edu">phh7@cornell.edu</a></td>
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Beginning Farmer Loans
FSA has a program to assist beginning farmers and/or members of socially disadvantaged groups to finance agricultural enterprises. Under these designated farm loan programs, FSA can provide financing to eligible applicants through either direct or guaranteed loans. FSA defines a beginning farmer as a person who:

• Has operated a farm for not more than 10 years
• Will materially and substantially participate in the operation of the farm

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Profitable Grass/Alfalfa Feeding for Dairy Cows
Jerry Cherney, Debbie Cherney, Cornell University and Paul Peterson, CCE Regional Crops Specialist

The optimum dairy-cow forage for animal health and profitability is a grass/alfalfa mixture. This recommendation is based on several lactating dairy-cow feeding trials at Cornell University comparing grass with alfalfa, mixing grass with alfalfa, and feeding different proportions of grass in a mixed ration.

Forage yield per acre has a large impact on economics. About 2 tons/acre are needed to break even with costs vs. milk income (Figure 1). Seed costs are a very minor component, even at very low forage yields. Relatively large differences in price per pound of seed and/or seeding rate have little impact on economics.

Results from a dairy-feeding trial with diets from 50 to 80% orchardgrass were used to determine the impact of corn-grain price on return (Figure 2). As diets increased in forage, the amount of corn in the diet decreased, and decreased the impact of corn price on return. These feeding-trial results suggest the following:

• When corn-grain is $2/bushel, maximum return per cow per day is a diet with 60% forage.
• With $4/bushel corn, the optimum diet is 65% forage.
• With $6/bushel corn, the optimum diet is 70% forage.
• With $8/bushel corn, the optimum diet is 80% forage; suggesting that $8 corn is too expensive to use in quantity in a dairy ration with grass.

A dairy-feeding trial comparing alfalfa and/or grass in diets was used to evaluate changes in corn-grain price (Figure 3). Amount of corn in the diet and milk yield increased as diets went from 100% alfalfa to 100% grass as the forage source. When corn price is low, maximum returns occur with a grass diet supplemented with considerable grain. At very high corn prices, alfalfa diets produce maximum returns, even though a 100% alfalfa diet was considerably lower in milk production than a grass diet. The diet with the greatest returns across the range of corn prices was 2/3 grass: 1/3 alfalfa.


Things Not to Do!
Are you getting ready to vaccinate your livestock? Here is a checklist of things that should NOT happen when vaccinating livestock:

• Vaccinate calves under 5-7 days of age
• Booster calves between 17 and 35 days of age
• Vaccinate and dehorn, move or wean at the same time
• Vaccinate when the temperature is over 85°F
• Use more than 2 types of gram negative bacterins (E. coli, Salmonella, Lepto, Brucella, Hemophilus, Moraxella, Vibrio) at the same time.
• Mix up vaccines and use more than 4 hours later
• Leave vaccines unrefrigerated or in sunlight
• Use frozen vaccine

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To find out more about FSA loan programs in Clinton and Essex County, contact Becky Ferry in the Greenwich office at 518-692-9940.