



# HEAT STRESS AND HEAT ABATEMENT TIPS FOR DAIRIES

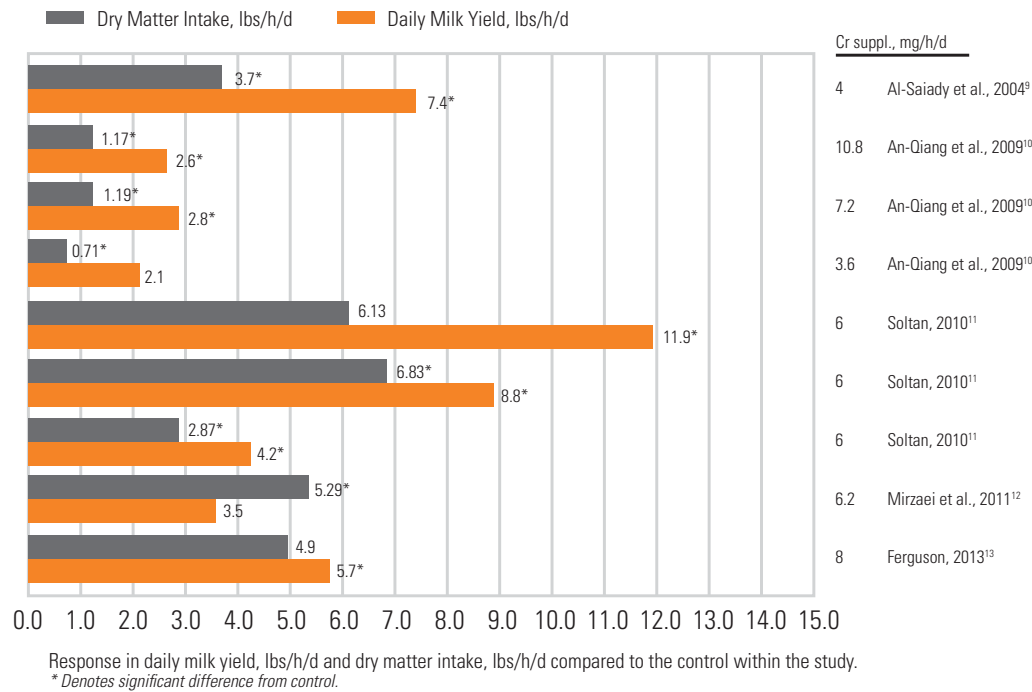
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**KEMIN**<sup>®</sup>

KemTRACE<sup>®</sup>  
**CHROMIUM**  
*Essential to you and your operation.*

# EFFECT ON CHROMIUM SUPPLEMENTATION ON HEAT STRESS

The influence of chromium on milk production has been attributed to its effects on energy metabolism reflected through decreased mobilization of NEFA from adipose tissue and increased insulin sensitivity. During extended periods of heat stress at different stages of lactation, increased glucose availability and utilization may have significant benefits to milk production. Research studies, designed to test the effect of chromium on milk yield under heat stress conditions, have shown cows supplemented with chromium yield more than control cows (Figure 3).<sup>9-13</sup>



**Figure 3:** Effect of chromium supplementation in lactating dairy cow diets on response in daily milk yield and dry matter intake, lbs/h/d under heat stress conditions.

## Summary

- Dairy cattle have historically been selected for traits contributing to productivity. As a result of this selection strategy, dairy cattle have become less heat tolerant.
- Climate controlled experiments indicate milk yield starts to decrease at a THI of 68.
- Keeping cows cool and eating are the two most important strategies for cows facing heat stress.
- There are multiple management and nutritional strategies available to dairy producers to combat heat stress.
- Kemin provides the solutions producers need to help optimize animal performance.

## REFERENCES

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# HEAT ABATEMENT TIPS

## The two most important things to do for cows facing heat stress:

1. Keep cows cool using fans, shade and water (for drinking, and spraying and/or soaking their bodies).
2. Do whatever is necessary to keep cows eating.

### Water

- Drinking water should be available in multiple places in every pen and exit alleys from the parlor. In a pen, there should be at least 3 inches of linear water trough space per cow.
- Clean waterers every day during the warm months. A cow's water needs increase dramatically when she is under heat stress. Make sure water is available, appealing and palatable.

### Shade

- Provide shade for all animals housed outside: place shades over feed bunks, waterers and resting areas.



*Heat Stressed Cow.<sup>14</sup>*

## Fans and Sprinklers or Soakers (areas needing cooling intervention are listed in order of importance)\*

- Holding pens.
- Far-off and close-up dry cows — cooling in these areas has been shown to increase milk production in the subsequent lactation and improve immune function. The advantage of cooling dry cows is carried into the next generation as well. Calves carried by cooled dams versus heat stressed dams have been shown to be healthier, grow better and perform better in their first lactation.<sup>8</sup>
- Maternity pens.
- Fresh cow and heifer pens.
- High production milking pens.
- Milk parlor.
- Milk parlor exit lane.
- Hospital pen.
- Work areas, such as cattle chutes and palpation rails.

\*For specifics regarding fan placement, size and type as well as specifics regarding appropriate design of soakers and sprinklers, consult the Elanco publication "Heat Abatement" which is available at <https://www.elanco.us/pdfs/heatabatementguide.pdf>. The Extension.org website has several useful pieces including "Evaluating and selecting cooling systems for different climates" available at <http://articles.extension.org/pages/17586/evaluating-and-selecting-cooling-systems-for-different-climates>.

## Management Changes

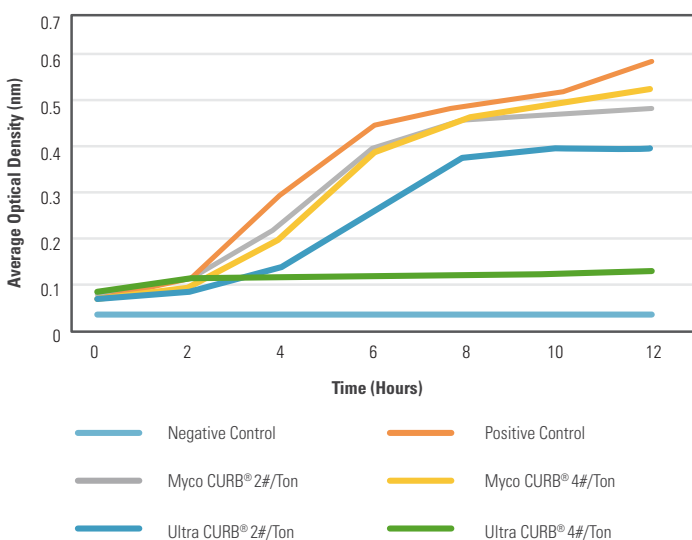
- Add extra waterers, either temporary or permanent, in the parlor return lanes if necessary.
- Clean all waterers daily.
- Begin mixing feed for lactating cow pens twice a day.
- Deliver fresh feed to the lactating cow pens in the early morning and late in the day.
- Push up often and remove leftover feed every day. Clean feed bunks thoroughly.
- Use high quality forages in all diets. Better quality forages are easier to digest and provide more nutrients pound for pound than poor forages. Moldy and spoiled feeds interfere with the proper functioning of the rumen, are prone to heating, decrease dry matter intake and can cause off-feed events.
- Do whatever is possible to decrease other stressors facing the herd: control flies, minimize lock-up times, work cattle during the coolest parts of the day or delay cattle work if possible.
- Herds using rBST should continue to use it in summer months.

## Nutritional Strategies

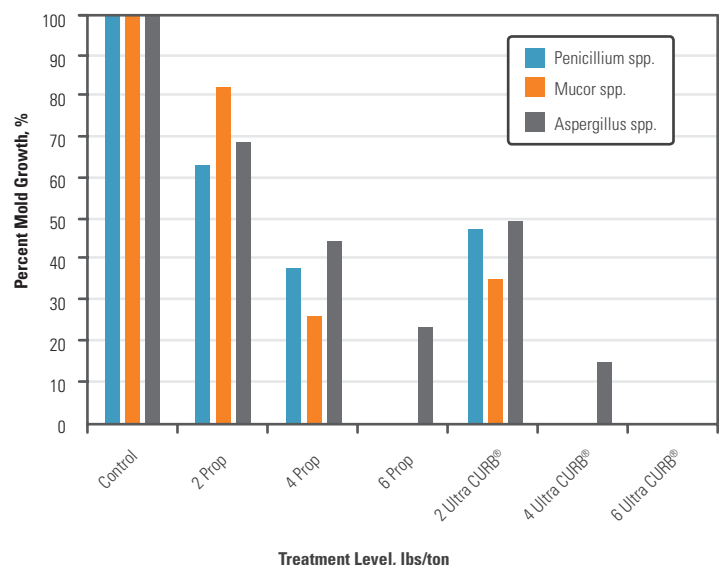
- Ensure diets have sufficient effective, digestible fiber. Avoid diets likely to induce subclinical acidosis.
- Chromium should be in all transition and lactating cow diets. Chromium has been shown to alter insulin action, increase dry matter intake and increase milk production under heat stress conditions.<sup>9-13</sup>
- Discuss with your nutritionist: increasing potassium, sodium bicarbonate and zinc levels in the diet.
- Consider adding products which have demonstrated ability to increase dry matter intake (e.g., yeast products), feed efficiency and/or improve gut integrity.

## FEED QUALITY

Just as heat can impact animal performance, it can also impact the feed ingredients used in dairy rations. Moldy or spoiled feed should not be fed to any group of animals during periods of heat stress, preserving these feed and feed ingredients becomes of utmost importance. Reports from Dairyland Labs indicate wild yeast counts are higher in 2016 versus previous years.<sup>15</sup> Nearly 20% of corn silage samples tested during the first three months of 2016 have more than 10 million CFU/gram of wild yeast.<sup>16</sup> Research by Limin Kung shows wild yeast starts a cascade of events leading to TMR heating<sup>17</sup> and spoiled feed. Research also shows acetic acid, along with propionic acid, helps control the growth of wild yeast and mold (Figures 1, 2).<sup>18,19</sup> Ultra CURB® Dry and Ultra CURB® Liquid have high levels of acetic and propionic acid to help control the growth of spoilage organisms.



**Figure 1:** Optical density at 600 nm by treatment<sup>18</sup> (optical density is a measure of yeast growth).



**Figure 2:** Control of mold growth<sup>19</sup> using propionic (prop) acid or Ultra CURB® Liquid.

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Kemin understands you need to raise healthy livestock that give consumers the nutritional and health benefits they are looking for, while also returning a profit. We focus our products and services to help you achieve optimal:

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