



Heat stress management in Israel.



Cows cooling off in the waiting room in the very hot Kibbutz Kala in Israel, near the Dead Sea.

Courtesy photos.

# Practical heat stress management tips

Ofier Langer for *Progressive Dairy*

## AT A GLANCE

Israeli dairy producers keep cows cool by ensuring each cow has enough space, utilizing a “cooling cycle,” creating a cooling shed on the farm and paying attention to where on the farm cows can become overheated.

Over the past few years, heat stress management has become a hot topic for dairy producers. Global warming is contributing to continuous heat waves, even in countries where they have been uncommon previously. Here in Israel, it is notoriously hot during the summer, with temperatures reaching 122°F in certain parts of the country. As a result of climate change, it is increasingly important for dairy farms to alter management techniques so high production can be maintained.

### How do dairy cows react to heat stress?

Dairy cows are vulnerable to heat stress. As temperatures rise, so does a cow’s body temperature and respiratory rate as she pants to cool down. Heat stress can reduce feed and water consumption, decrease rumination and movement, and drop daily milk yield as a cow strives to conserve energy. These physiological changes negatively impact health and productivity, underscoring the importance of management strategies like shade, cool water and adequate ventilation, to mitigate heat stress and ensure the well-being of these animals.

### The value of cow comfort

Our priority is to provide our cows with a comfortable and pleasant environment. If we fail to do this, milk production will suffer. Reduced fertility rates are also highly correlated with heat stress. This double whammy translates into a decrease in revenue on our profit and loss statement.

### Early warning signs

As temperatures rise, be on the lookout for signs of heat stress, such as increased body temperatures (over 102.2°F), elevated respiratory rates (over 70 per minute), reduced milk yield, decreased food and water consumption, and decreased rumination and movement (**Figure 1**).

### Early detection is key

Early detection of heat stress in dairy cows enables quick intervention, mitigating its adverse effects on well-being and productivity.

Heat stress is now available as a

protocol for herd management software. Few herd management companies provide early detection systems. An early warning would be sent to the farm manager based on parameters they can measure as part of the heat stress scoring process. Consider implementing one of the available systems in your area.

### Actions we often take in Israel

Israeli dairy farmers have long taken proactive steps to cool cows during the summer. The effort is now becoming more necessary worldwide.

There are several effective methods Israeli dairy farmers use to reduce heat stress on the farm. A key is to ensure adequate space per cow. Heat stress management is more effective when we give each cow the right amount of space – at least 22 square feet per cow.

We have found success managing heat by creating a cooling cycle that considers these two concepts:

- 1 Heat is transferred from a cow to water through thermal conduction.
- 2 Heat is transferred from water to the environment by thermal convection (the dominant form of heat transfer in liquids and gases).

The first step is to enable the transfer of heat from the cow to water. We do this by applying water onto her back using a sprinkler system. Sprinklers are situated 6.5 to 8 feet above the ground, depending on sprinkler type. We aim for a height that ensures water drops are distributed evenly to penetrate the cow’s hair coat.

The second step is to disperse, or convection, the water into the air. We accomplish this by creating wind with a forced ventilation system. This requires gusts of wind so the current air can be displaced with the new air.

This setup uses a combination of several types of ventilation systems, including a high-volume, low-speed (HVLS) fan, aka helicopter fan. The 24-foot diameter of this fan can move the necessary volume of air up to 22,000 square feet, essentially pushing the air across the barn. Within the cooling room, we use much stronger fans.

### Create a special cooling room

We create a special room to conduct the cooling session, commonly called a cooling shed. It can be situated anywhere that makes sense, even in the holding pen. To ensure success, the room must be equipped with the right equipment. For the lactating cows, we use the waiting room as the cooling room.

Depending on the weather, cooling cycles may be performed several times a day. When it is hot, we start a new

**FIGURE 1** Signs of heat stress

As temperatures rise, be on the lookout for signs of heat stress, such as:



Breathing rate increased to over 70 per minute



Increased body temperature over 102.2°F



A decrease in daily milk production



Decrease in rumination



Decrease in activity and movement

cooling cycle every time the top hair on the cows dries.

### Cow comfort outside the parlor and holding pen

While the holding pen is a prime target for excessive heat generation, it is not the only place cows become overheated. Pay attention to other areas of the facility to ensure heat stress is not an issue. As mentioned before, ensuring each cow has the right amount of space goes a long way in preventing heat stress.

In Israel, the HVLS fan is essential. Additionally, we also incorporate foggers near bunks and water troughs.

### Cow comfort is a win-win for everyone

Though we can do little to reverse global warming, we can impact what happens on our farms. We are charged with providing our cows with a comfortable environment. A heat stress management system should be planned and implemented to give our herd what it needs to thrive despite the heat.

According to my colleague, Dr. Israel Flamenbaum, investing in cooling systems and running them is the most profitable return on investment in Israel and now, across the world. A cooling investment pays for itself within two years, making it a



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very viable investment.

Taking advantage of the cooling systems available in your area is highly recommended. 🐄

*Langer owns Israeli Dairy School (www.dairyschool.co.il), providing practical training for global companies and organizations.*

## DAIRY SUSTAINABILITY MATTERS TO CONSUMERS

It's no surprise consumers are increasingly removed from agriculture. They don't always understand farmers' legacy as the original stewards of the land and their strong desire to pass the farm onto the next generation. Yet, research continues to show consumers are looking for products they can feel good about purchasing as a way of showing they care for the earth and its natural resources.

The good news is dairy farmers have been leading the way as stewards of the earth's resources for generations. Dairy farmers have fine-tuned practices to sustain their operations today and to help secure a brighter tomorrow.

Building on this strong legacy, national and local checkoff staff are seizing opportunities to connect consumers to dairy's many sustainability success stories.

#### Here are some examples:

##### Time.com Placement:

An in-depth article exploring how dairy farmers such as Pennsylvania's Brett Reinford manage methane and greenhouse gas emissions, two topics of interest with consumers, will be shared on Time.com. Time.com has a global audience of 105 million readers which provides a strong platform to connect with consumers and thought leaders here and around the world.

##### Climate Week:

Sustainability will take center stage during Climate Week, September 17-24. Your checkoff team is collaborating with other groups to plan events and media promotions to bring dairy into the conversation. These events will take place in-person and virtually, across social media and other online spaces, allowing consumers to learn about dairy's sustainability story in approachable and innovative ways.

##### Thought Leaders:

Sustainability experts and thought leaders are another critical audience as they often represent academic and research institutions. Thought leaders will connect with dairy's sustainability story at key events such as the World Food Prize dialogue and the 2023 United Nations Climate Change Conference.

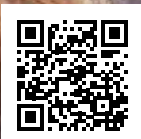
**Your dairy checkoff team is passionate about making impactful connections with consumers and thought leaders to help secure a bright future for dairy by showcasing how farmers have been - and continue to be - responsible stewards of our natural resources.**

**"WE'RE WORKING HARD TO FEED THE WORLD IN A WAY THAT PEOPLE CAN FEEL GOOD ABOUT. IT'S IMPORTANT FOR US TO GET THAT MESSAGE TO CONSUMERS."**

*- Britt Dinis,  
Empire Dairy, Colorado*

Your dairy checkoff works hard to promote all you do to care for your cows, the earth and its resources. Your sustainability story connects with consumers of all ages and positions dairy as a true leader in environmental stewardship. And that is making every drop count.

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