

# Ariz. Dairy Makes Heat Stress Management A (Cool) Breeze

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temperature during the day, according to Thompson, never dropped below 100 degrees. At night, he said, the temperature "seldom went below 90 degrees."

Thompson pointed out that, like the saying, it's not the heat, it's the humidity that can be crucial.

Thompson said, "I'd rather have 115 degrees at 6 percent humidity than 80 degrees at 90 percent humidity."

Heat stress on the milking herd results in less food intake, crippling production.

From a PowerPoint presentation, Thompson showed evidence of cows standing near misters from a commercial supplier that included a marquee-like digital thermometer. The thermometer was clear to everyone who saw: shade temperature at the time was 111 degrees, but cooling temperature stood at 59 degrees.

Thompson said he spent \$960,000 on equipment to cool cows. The equipment has sophisticated monitors on ambient temperature, humidity, and wind velocity, including date and time of day.

Using the commercial mister, despite the swirling vapor, the manure pack remains dry. "About 750 gallons per minute evaporate without ever touching the ground," said Thompson.

The key term is "evaporative cooling," noted Thompson. Enough moisture is applied so the natural, evaporative cooling from the cow's hide provides relief for the cows.

Cooling helps maintain feed intake, increases milk production, improves reproduction, helps the cow maintain body condition, decreases illness, and decreases mortality. All lactating pens are cooled.

As a result, the current herd average is 28,900 pounds of milk at 3.5 percent fat. The herd is milked three times per day.

According to the University of Arizona, Stotz Dairy has been the highest producing herd in Arizo-

na for 15 of the last 18 years.

Thompson, who grew up in California (near Disneyland), learned a lot of dairying from his uncle, who operated a 60-cow Guernsey herd in Minnesota in the early 1970s. The uncle, who never took vacation, "lived and loved those cows," Thompson said.

Thompson's father was an aerospace engineer with North American Rockwell who took early retirement and wanted to partner with a dairy near Alexandria, Minn.

Tom Thompson, who obtained a degree from California Polytechnic State University in San Luis Obispo, Calif., decided on Arizona as the place to be for the dairy. He purchased the land 23 years ago and began, in 1981, with 539 springers from Wisconsin.

Land value was about \$600 per acre in 1980. Now, the same land is valued at \$25,000 per acre. Needless to say, Thompson noted, "nobody is building a dairy with less than 2,500 milking cows."

Stotz current milking herd size is 3,676.

Back in the early 1980s, herd average was about 19,800 pounds milking three times a day. The first expansion was to 800 cows with a 24-stall polygon. In 1988, the dairy began a 4X per day milking over a two-year period. At the same time, the herd was under a pre-approved BST test.

Though with the 4X per day milking the rolling herd average soared to 25,000 pounds, the stress from several factors, including heating, was an issue. The farm returned to a 3X a day milking.

In 1990, the herd was expanded to 1,000 cows. In 1993, a 34-stall, polygon, parabone-milking parlor was built.

A second milking parlor — a double-30 parallel parlor — was added in 1995. The barns are equipped with automatic detachers, clean-in-place wash-up system, cow wash sprinklers, air

crowd gate, air-operated cow indexing stalls, and automatic cow movement system.

The parlors are cooled in the summer by the evaporative cooling system Milk is cooled through a precooler and a rapid plate cooler, which combine to bring the temperature down to 38 degrees before it enters the silo.

Water used in the precooler, vacuum pump, and refrigeration system is recycled for the cow wash and barn flush system. Heat recovery units are used to conserve electricity.

The newer parlor uses a computer chip attached to each cow. This transponder automatically records when the cows comes to the parlor, how much milk she produced for that milking, and how long it takes to milk her. The computer utilizes pedometers and conductivity to aid in the detection of sick cows and cows in heat. The computer also uses a sort gate system to catch cows as needed.

In September 1995, the herd was expanded to 3,600 cows. Stotz Dairy went from 18 to 38 employees "overnight," said Thompson.

Stotz Farm employs 43 full-time, including six lead milkers, six assistant milkers, six trainee/cow pushers, four relief milkers, six outside and relief workers, four feeders, four calf feeders, three herdsmen, two assistant managers, office manager, and a general manager.

About 80 percent of the workforce lives on the dairy. Most of the workers are Hispanic.

At the conference, Thompson reviewed the more than two dozen complex protocols employed at Stotz Dairy for nutrition, calving procedures, fresh pen management, reproductive palpations, heat stress, replacement heifers, and milking management.

A key area, nutrition, involves a true TMR three times a day. After milking, cows get a fresh feed. A nutritionist formulates the



Tom Thompson, Stotz Dairy, right, spoke at the PDMP meeting Tuesday in Grantville. Introducing him was Dave Hileman, PDMP president. Photo by by Andy Andrews, editor

rations. Shade is provided to 50 percent of the length of the manger.

Each scraping from the feed areas is weighed to see how much, exactly, the cows eat. The manger scraping measurements include detail on cows in pen, what fed, percent ration, total leftover, and a computer program provides recommendations to improve the ration.

"We try to cater to the cows and do what they'd like us to do," said Thompson.

The farm has used BST since the beginning. Thompson measured a 14.8 percent increase in total pounds milked, about 10 pounds increase per treated cow. That equates, over a 10-11 day injection cycle, of a 5.2 percent

increase in feed intake and a 7.5 percent increase in feed expense, he noted.

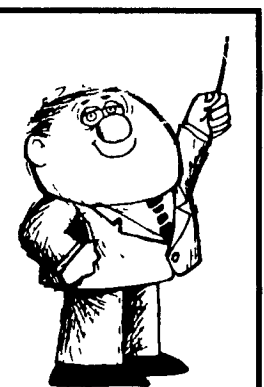
Despite some talk of "corporate farms" and the size of large-scale farms, Thompson believes in the American farm enterprise system.

"We still think of ourselves as a family dairy," Thompson said. Tammy, his wife, is office manager. His oldest daughter, Jennifer, a senior at Cal Poly, accompanied him to the Grantville conference.

The protocols are being revised steadily to improve the herd.

Arizona is still a "milk-deficient state," said Thompson. The state relies on imports, especially

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