

How Dairy Breeds Compare On Hot Summer Days

GEORGE F.W. HAENLEIN
Extension Dairy Specialist
University of Delaware

NEWARK, Del. — Forty years ago in this country, Holstein cows weren't the primary producers of milk that they are today.

In addition to Holsteins (and in almost equal numbers) at least five other European dairy breeds produced milk for commercial sale, including Ayrshires, Brown Swiss, Guernseys, Jerseys, and Milking Shorthorn.

European dairy farmers have many more dairy breeds than these six, particularly Simmental. None of these breeds have ever played a role in the U.S. dairy industry, not to mention dairy sheep and dairy goats, although the latter have increased in importance in the last 20 years.

European dairy breeds have been the milk producing leaders; for this reason, they have been exported for crossbreeding around the world.

Because the Holstein cow, for various reasons, is predominant in the United States today, we think less about physiological differences of the different breeds, even in research.

Yet when travelling through Florida, I witnessed many Holstein herds with a large component of Jersey cows. Why?

People familiar with older physiological research conducted in temperature controlled chambers at the Missouri Agricultural Experiment Station will recall that some cow breeds differ in heat tolerance.

For example, the Jersey cow, although smaller than the Holstein, has a larger body surface area relative to her bodyweight, so she can get rid of more body heat when necessary. This explains, in part, why Jerseys are mixed in with Florida Holstein herds, as

well as why there aren't nearly as many Jerseys in the northern United States.

I recall a discussion years ago at UD's Farm and Field Day, to which I had invited the famous Dr. F.B. Morrison from Cornell University to speak. He stated emphatically that Brown Swiss cows were much better suited than Holsteins (a big push then) for export to hot and humid places — Venezuela, for example — because Brown Swiss were more tolerant of heat.

It stands to reason, Holsteins and Brown Swiss have different zoological ancestors and origin.

The theory is that Brown Swiss were related to Zebu cows of India before migrating west to Europe thousands of years ago. And Zebus are more heat-tolerant than European cows.

However, discussion about breeds has been limited in recent years — until now.

I found an interesting new study from the University of Arizona. It's not there most of the time for any cow, European or Indian.

The researchers are interested in lowering heat loads of cows as they do in Florida, not only to let panting cows suffer less, but more significantly, because people in Arizona want to buy their own fresh milk, not milk powder or evaporated milk. And they don't want milk shipped in from Pennsylvania, Delaware, New Jersey or Maryland.

The dairy farmers milking cows under such hot conditions have to survive financially. This means non-suffering cows that will eat better, produce more milk and reproduce more normally. But how can dairy farmers ensure that cows suffer less under hot conditions?

Inventing ever-better cooling systems for cows has been one

solution for the hot conditions in Florida and Arizona.

It used to be that shade trees or shading structures were recommended until the cows indicated that was not good enough. Thus, fans were added to cool cows — still not good enough — and overhead water sprinklers to soak cows were added to the fans and the shade to make a difference for the suffering cows.

Yet, this new Arizona study adds one more factor — genetic differences of cows, or different breeds.

I looked up some older research conducted by Florida workers in Central America, covering almost 3,000 lactations in 19 herds with six different breeds and crossbreeds including Holsteins and Brown Swiss.

The data indicated that Brown Swiss were less sensitive than Holsteins to heat stress as evidenced by their milk records.

Crossbreeds with 50 percent Holstein blood averaged 5,661 pounds milk/year, compared to 50 percent Brown Swiss with 6,219 pounds milk (for 385 and 145 records, respectively) under typical Central American feeding and management conditions; 88 per-

cent Holstein crossbreeds had 5,837 pounds milk versus 88 percent Brown Swiss, making with 78,643 pounds of milk. (Results based on 107 and 89 records, respectively.)

Given this, the new Arizona research wanted to find out how Holsteins, Brown Swiss and Jerseys react physiologically under either just shade, fans or water-cooling management on hot Arizona days.

Clearly, only the water-cooling system prevented the cows from suffering elevated body temperatures (101 degrees Fahrenheit) while cows with fans or under shade had 102 and 103 degrees, respectively. Here in Delaware we have recorded similar data in our UD herd.

The Arizona cows under the water-cooling system also had the lowest respiration rates at 40 to 56 breaths/minute, while the cows under fans had 63 to 70 breaths and the shade-only cows 66 to 85 breaths/minute.

Brown Swiss had the highest rate of skin evaporation. The skin temperature of Brown Swiss was cooler than that of the other breeds under any cooling management system. Respiration rates were

less for Brown Swiss under the water-cooling system.

Jerseys had the lowest respiration rates under the shade-only system, probably because they had the largest relative skin surface area, giving them an advantage over the other breeds for heat loss when no fan or water cooling was available.

When cows were exposed to direct sunlight, Holsteins absorbed 89 percent of that solar heat load, 11 percent was reflected, while Brown Swiss absorbed 81 percent and reflected 19 percent. Add to this the metabolic heat production and subtract the energy given up through skin and breathing evaporation, these cows can suffer a body temperature rise of 2 degrees Fahrenheit in only 20 minutes.

Even under cooling systems, it may take more than an hour to return to normal body temperature. It is understandable why then cows do not want to eat, to save themselves from more metabolic heat production.

Dairy farmers who understand these physiological and genetic studies not only can help their cows, but improve their bottom line as well.

Champions Named At Atlantic National Junior Angus Show

TIMONIUM, Md. — Young Angus breeders from 16 states competed for top honors in the 1998 Atlantic National Junior Angus Regional Preview Show. Craig Wallace, Mt. Vernon, Mo., judged the 262 entries shown at the event May 23 in Timonium, Md.

Bradley Lutz, Mt. Jackson, Va., walked away with grand champion honors in the owned heifer division. Whitestone Chloe J051, a January 1997 daughter of Rite 9FB3 of 5H11 Fullback, was the winning entry. She was first named the early spring heifer calf champion.

Reserve grand champion owned female honors were awarded to Jesse Clark, Edinburg, Va. Clark's entry, a March 1997 daughter of Leachman Saugahatchee 3000C, is named Champion Hill Sandoe 817. She first topped the late spring heifer calf division.

In the bred-and-owned heifer division, Kruegers Errolline Lexi captured the grand champion title for Amy Kruegar, East Fallowfield, Penn. The winning entry is a January 1997 daughter of O C C Backstop 888B and

was first named the spring heifer calf champion.

Bree Taggart, Waynesburg, Penn., led T C C Daltons Gina 702 to the reserve grand champion bred-and-owned female award. Krugerrand of Donamere 490 sired the March 1997 entry that was first named reserve spring heifer calf champion.

Grand champion bred-and-owned bull honors went to Carl Detwiler, Roaring Spring, Penn. G R F Touchback 018, a May 1997 son of Bushs Flashback 880, was the name of the entry.

Deanna Bloom, Westville, Ind., took reserve grand champion bred-and-owned bull honors with Car Don Durango B399, a February 1997 son of N Bar Emulation EXT.

Jeff Covell, Frederick, Md., claimed both the grand and reserve grand champion steer titles at the event. The grand champion entry was Covells Reload 9711, an April 1997 son of Rito 9FB3 of 5H11 Fullback, while Champion Hill Kylo, a May 1997 son of Leachman Saugahatchee 3000C, was the reserve winner.

Troy Fair Youth Dairy Winners



Ayrshire Champions at the Troy Fair Youth Show pause to smile at the camera. Shown, from left are Justin Goodwin with the reserve junior champion, Amanda Cole with the junior champion, Bradford County Alternate Dairy Princess Jackie Schriener, Ronnie Croft with the reserve grand champion, Amberleigh Yurkanin with the grand champion and Bradford County Dairy Princess Talitha Coolbaugh.



Heather Yurkanin's Elm Brook Sooner Osha was named supreme champion of the Troy Fair youth dairy show. Shown with the winner are Dairy Maid Tara Gray, Alternate Dairy Princess Jackie Schriener, Sullivan County Dairy Princess Jill Broschart, Rick Hoover, president of the Troy Fair, Heather Yurkanin, dairy princess Talitha Coolbaugh, and Dairy Maid Ashleigh Selfridge.