

**Some markets not available due to the holiday**

**Penns Valley Livestock Market, Inc.**

Auction every Tues. 7 p.m. Centre Hall, Pa. Report supplied by Auction Tues., Nov. 24, 1992  
**RETURN TO FARM CALF** 120.00-110.00.  
**GOOD VEAL:** 70.00-99.00.  
**COMMON VEAL:** 25.00-69.00.  
**COMMON STEERS:** 44.00-63.50.  
**COMMERCIAL COWS:** 46.00-52.00.  
**CANNERS-CUTTERS:** 43.00-51.50.  
**SHELLS:** 30.00-42.00.  
**COMMON HEIFERS:** 46.00-61.50.  
**COMMON FEEDERS:** 45.00-70.00.  
**BULLS:** 50.00-53.00.  
**HOGS:** 38.00-42.00.  
**HEAVY HOGS:** 35.00-40.00.  
**SOWS:** 32.00-35.00  
**ROUGHES:** 22.00.

**Four States Livestock**

Hagerstown, Md. Nov. 25, 1992  
 Report supplied by Auction  
**SLAUGHTER COWS UTILITY** 47.00-51.00; **HIGH DRESSING UP TO** 52.75; **CANNERS** 43.00-47.00; **SHELLY** 43.00 DOWN.  
**BULLS:** YG #1 1590 LBS. 60.75; ONE

2555 LBS. 57.25; YG #2: 53.00-57.00.  
**FED HEIFERS: SELECT HOLSTEINS** 53.00-56.00; **STANDARD** 47.00-51.00.  
**VEAL CALVES: CHOICE** 250-350 LBS. 92.00-97.00 **GOOD** 80.00-90.00; **CULLS** 60-100LBS. 45.00-55.00; **WEAK/ROUGH** 45.00 DOWN.  
**FARM CALVES: HOLSTEIN BULLS** #1 95-120 LBS. 130.00-161.00; 80-90 LBS. 100.00-135.00; **HOLSTEIN HEIFERS** #1 95-120 LBS. TO 145.00-190.00; 75-90 LBS. 100.00-142.00; **BEEF X BULLS** 100-150.00  
**BUTCHER HOGS: US#1&2** 215-260 LBS. FEW 41.00-42.25; 270-325 LBS. 35.00-37.50; 350-450 LBS 31.00-37.00.  
**SOWS:** 300-500 LBS. 28.00-32.50.  
**BOARS:** 400-500 LBS. UP TO 29.25.  
**STOCK CATTLE STEERS:** 300-500 LBS: 75.00-85.00; 500-700 LBS. 70.00-81.00; 700-900 LBS. 65.00-75.00; 900-1050 LBS 60.00-72.00.  
**HEIFERS:** 300-500 LBS. 63.00-73.00; 500-700 LBS. 57.00-69.00; 700-900 LBS. 53.00-60.00.  
**BULLS:** 400-600 LBS. 69.00-77.00; **TWO SIMMENTALS — ONE** 1260 LBS AT 77.00; **ONE** 955 LBS AT 61.50.  
**DAIRY REPLACEMENTS: LARGE FRESH AND SPRINGING** 900.00-1060.00; **REGSITERED HOLSTEIN BULLS** 800.00-1,175.00; **HOLSTEIN HEIFERS, PER POUND:** 300-500 LB 69.00-80.00; 500-600 LB. UP TO 72.00;  
**LAMBS CHOICE TO PRIME:** 100-115 LBS 58.00-65.50; 80-90 LB. 65.00-74.00; **THIN FEEDERS:** 40-70 LB 50.00-64.00.  
**SHEEP:** 19.00-27.00.  
**GOATS: LARGE UP TO** 65.00; **MEDIUM** 28.00-43.00.  
**PIGS AND SHOATS: BY THE HEAD,** 20-35 LBS. 16.00-20.00; **BY THE POUND,** 100-140 LBS. 32.00-36.00; 170-200 LBS. 32.00-38.00.

**COLLEGE PARK, Md. —** Imagine feeding our planet's ever increasing population by growing normally heat-sensitive crops in the Sahara desert, or any other extreme environment.

Although this is not a current possibility, it might be within the next century. Dr. Lynn Zimmerman is doing the basic research that could lead to the genetic engineering of heat-tolerant plants.

When exposed to a sudden shift in temperature, a small set of "heat

shock" proteins (HSPs) accumulate in cells. This can happen, for example, when a person has a fever. Or, for a plant, when there is a hot, sunny day.

The heated cells are put in something like suspended animation — they temporarily stop doing what they were doing and produce HSPs.

Heat shock has "an absolutely universal response" in all living things, said Zimmerman, an associate professor at the University of Maryland Baltimore County, whose research is supported by the Maryland Agricultural Experiment Station.

The basic heat shock mechanism is almost identical in most organisms, Zimmerman said. For example, the gene that codes for HSP70, one of the many HSPs, is significantly similar in both the common bacterium *E. coli* and humans.

The heat shock response is a dramatic shift in the expression of genes that helps stabilize the cell for a relatively short period of time.

If the heated condition were to persist, the cell adapts.

"It will go back to normal operations within about 12 hours," Zimmerman said.

The heat shock response is a normal occurrence in plants on hot days. However, it occurs slowly as the day goes by. The plant has plenty of time to adjust and adapt to the new temperatures. In the lab, heat shock can be made to happen almost instantaneously.

Zimmerman has been studying the heat shock response, using car-

rot cells as a plant model, for more than five years. She is currently investigating the role that small HSPs play in protecting plant cells from high temperatures, a condition known as acquired thermotolerance.

Acquired thermotolerance is the ability to survive a normally lethal high temperature. HSPs are known to be very important in developing this ability.

Zimmerman's study may help us to understand how plants acquire it, as well as lead to the future creation of heat-resistant plants — plants that can thrive in the desert, or other extreme environments.

Zimmerman is using a state-of-the-art technique involving gene manipulation. She has chosen a specific family of HSPs, out of the many that occur in the cell, to try to block. If things go as planned, this blockage will reduce or completely block the plant's thermotolerance.

By choosing one family of HSPs, Zimmerman hopes to find the specific HSP that is critical for acquired thermotolerance.

Using this new technology is a tricky business, however. "There is a lot of uncertainty," Zimmerman admitted. Getting the cloned genes into the cell, and having them work once they are there, is difficult.

Even then, there may not be a change in thermotolerance. However, if her experiments do work, we will have gained some useful knowledge toward understanding the heat shock response.

**Research May Lead To Heat-Tolerant Plants**

**North Jersey Livestock**

Hackettstown, NJ Tuesday, Nov. 24, 1992  
 Report supplied by auction  
**CALVES** 20-1.87% .  
**COWS** 28-53% .  
**EASY COWS** .05-.43% .  
**HEIFERS** 40.66.  
**BULLS** .45-.63% .  
**STEERS** .47% -.71% .  
**HOGS** 30-37.  
**ROASTING PIGS EACH** 15.00-31.00.  
**SOWS** .15.  
**SHEEP** 20-.51.  
**LAMBS EACH** 29.00-79.00.  
**LAMBS PER LB.** 30-78.  
**GOATS EACH** 36.00-127.50.  
**KIDS EACH** 13.00-68.00.  
**HIDES** .50.  
**TOTAL** 1041.

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**SPRAYER LICENSE UPDATE MEETING THURSDAY, DEC. 10, 1992 9:30 A.M.**

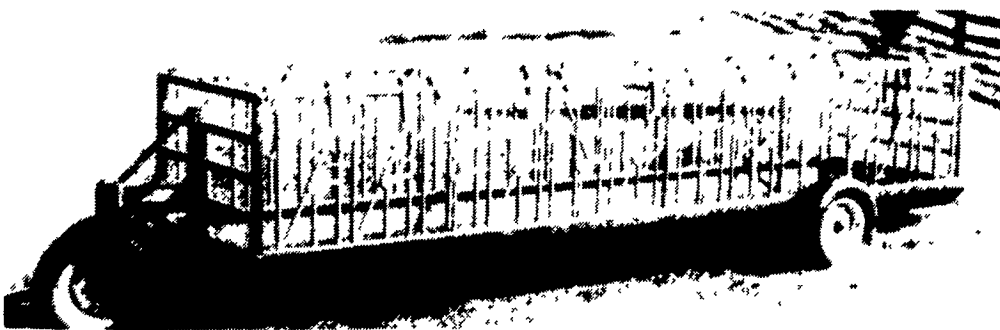
Speakers: Mike Fleming  
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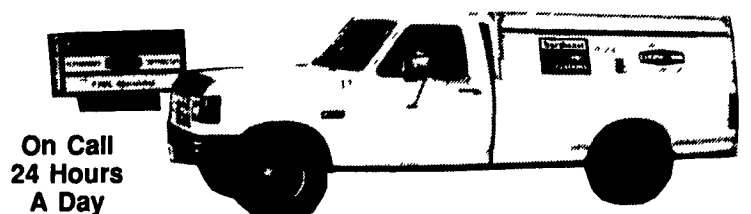
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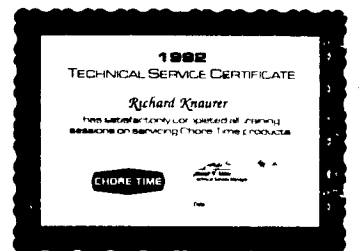
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