

# ISU Extension View

News from ISU Extension to NE Iowa Dairy Producers

Volume 10

[www.extension.iastate.edu](http://www.extension.iastate.edu)

July 2002



*Many thanks to all who returned the surveys evaluating this newsletter. The feedback was extremely positive overall and some good suggestions were made to help improve it over time.*

*More than 350 people attended the 4-State Dairy Management Seminar June 19 and 20 in Dubuque. Attendees represented more than 8 states and gave the conference a great rating.*

*Coming up later this summer is the Upper Midwest Grazing Conference in Dubuque, which is detailed inside the newsletter.*

*If you know of potential new dairy producers, it may be a good time to encourage them to get into the dairy business thanks to the dairy provisions of the farm bill for the next three years. Despite high cattle prices, the new bill may help take a bit of the risk out for them.*

Dale Thoreson and  
Larry Tranel, ISU Field Specialists  
Dairy/Beef and Forages  
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## Upper Midwest Grazing Conference

Dubuque is again the host site for the Upper Midwest Grazing Conference on July 30, 31 and August 1 at the Midway Hotel. Last year, 120 attendees from seven states and two foreign countries attended. This year again promises to be a great conference with Dr. Jim Gerrish as our keynote speaker. Karen Sullivan and James Cropper, from NRCS in New York and Pennsylvania respectively, will be joining us to share their knowledge and experience.

There will be plenty of networking opportunities and good solid information from a mix of beginning and experienced producers to Extension personnel.

Many beginning producers are starting their dairy career through grazing, and we need more young people in the dairy business. **If you are a student considering a dairy career, your registration fee will be subsidized and you can attend the three days for only \$20.**

More details and a registration form are inside.

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#### **State Dairy Specialists:**

- Dr. Marj Faust
- Dr. Lee Kilmer
- Dr. Leo Timms

### **NE Iowa Dairy/Beef and Forages Calendar**

#### **July**

- 12** Ag Professional Field Day, Nashua Experimental Farm  
**14-17** American Forage and Grasslands Conference, U of MN  
**15** Pasture Walk, Jack Tinker (beef), Edgewood  
**16** Pasture Walk, Dan Beard, 2954 Middle Sattre, Decorah  
**30-31** Upper Midwest Grazing Conference, Dubuque, 583-6496

#### **August**

- 1** Upper Midwest Grazing Conference, Dubuque, 583-6496  
**1** Pasture Walk, Tran-Land Dairy Heifers, Kieler, WI, 1:30 pm  
**8-18** Iowa State Fair, Des Moines

#### **September**

- 5** Fall Field Day, Nashua Experimental Farm  
**21** Iowa Dairy Classic, Fairgrounds, West Union  
**24-26** Farm Progress Show, Alamenn

#### **October**

- 2-6** World Dairy Expo, Madison, WI

## **Practical Pinkeye Solutions for Cattle Producers**

Pinkeye has been a headache for cattle producers for more than 120 years, yet we still know relatively little about the exact causes and absolute treatments for this persistent pest.

Pinkeye, traditionally associated with *Moraxella bovis* bacteria, is identified by redness in the outer edges of the eye, squinting, tearing and clouding of the cornea. Other organisms, such as *Brannamella ovis*, also may be involved. Severe cases can end in low weaning weights, blindness or eye loss.

Scientists speculate that some cattle can carry the *Moraxella bovis* bacteria naturally and may act as a source of infection for other cattle. Dust, human handling, face flies and direct contact can spread the bacteria.

The actual outbreak is most likely initiated by eye trauma, said Annette O'Connor, assistant professor for Iowa State University's Veterinary Diagnostic and Producing Animal Medicine department. "Flies, dust, ultraviolet (UV) light, hay feeders and long pastures are all thought to contribute to eye trauma. The bacteria enter the eye through the injury." It is also thought that infection with IBR or *Mycoplasma bovoculi* may predispose cattle to pink eye.

While there are several options available for prevention, some are costly as well as difficult. "Prevention is sometimes difficult because there are different strains of the organism and various causes," O'Connor indicated. "Producers can spend a lot of time correcting one potential cause just to learn it's not the root of the problem."

Reducing trauma sources, such as dust, projectiles on hay feeders and long grasses in pastures may be useful along with observing general biosecurity measures.

Because pinkeye seems to be more prevalent in summer months, producers should try to avoid introducing new cattle in the summer. "If you have to purchase new cattle in the summer, isolate them and contact your veterinarian about using prophylactic antibiotics that may remove the organism from carrier animals," O'Connor said. "Practicing good biosecurity measures, such as isolating recently purchased cattle, may reduce the risk on introducing *M.bovis* into your herd. "

O'Connor said vaccination against the bacteria should be considered only after realizing the limitations. "The vaccine may not be made for the particular strain of bacteria causing the pinkeye or might not provide complete coverage causing producers to spend time and money treating a disease that could very likely resurface," she said. "Additionally, a particular vaccine may be effective one year, however the following year a different strain appears in the herd and the vaccine will be less effective."

Reducing fly numbers on the farm is a commonly suggested but difficult preventative measure. "Unlike horn flies, face flies spend very little time in contact with individual cattle," O'Connor pointed out. "Therefore, insecticides applied directly to the animal may not reach a lethal dose."

Producers already dealing with pinkeye should isolate and treat only the affected cattle. "Don't spread the bacteria by handling and treating cattle that don't need it," O'Connor cautioned. "Isolate sick cattle from the herd and treat them according to your local veterinarians recommendations." **For more information, contact your local veterinarian.**

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By Wendy Miller, Media Specialist, Iowa Beef Center, Iowa State University, Ames, IA

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### ***Just thought you might want to know....***

**Thirty four** classes from **thirteen** schools in NE Iowa involving **over 620** youth attended Iowa's Dairy Story to learn about dairy cows this past spring and tour the facilities.

## Low Cost Crowd Gate Work Well

Can a dairy producer install an effective crowd gate for \$50?

If you ask producers Dale and Dee Gaul, Peosta, the answer is yes. Dale and Dee took the advice from ISU Extension in designing a very simple crowd gate that is "working very well" they remarked.

The concept starts with a 2 inch PVC pipe that is 2 feet narrower than the width of the holding area. Step 2 is setting two eyebolts in the PVC pipe about 1/3 of the distance from each end.

Step 3 takes two screw-in insulators installed in the front of holding area and two in the back with the exact same spacings as the eyebolts in the PVC pipe. They should be just under any rafter/obstruction.

Step 4 uses high tensile wire, with a wire tightener on each. Tie to insulator in back, thread through eyebolt and tie to insulator in front. Then tighten wire. Repeat on the other side. The PVC pipe is now hung on the high tensile wire and able to move back and forth on the eyebolts.

Step 5 begins by finding the center of the PVC pipe. Measure a distance four feet from the center in both directions and drill a hole. Connect a strong rope or wire cable through both holes which are then tied to become a triangle so the gate can be

evenly pulled. This is connected to the pull rope.

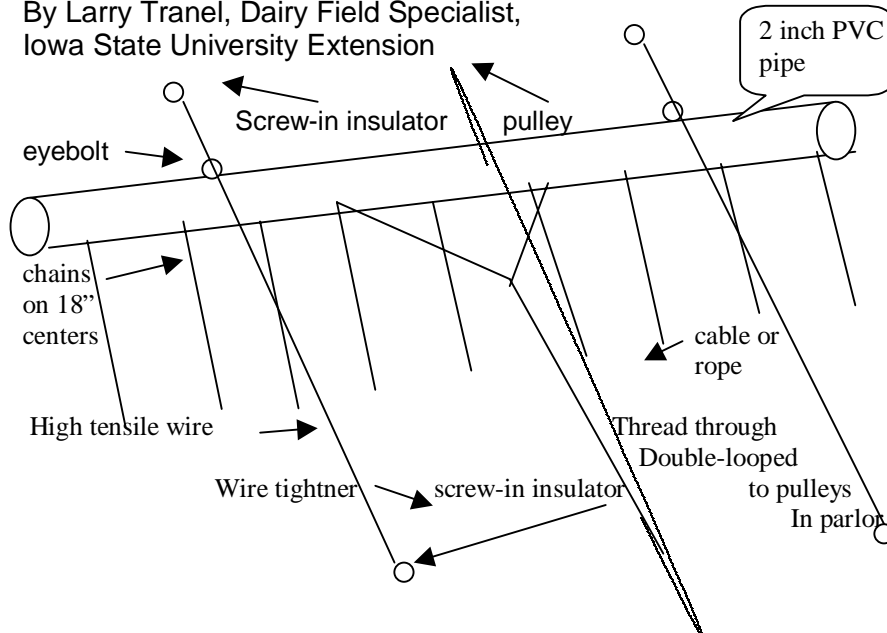
Step 6 involves drilling two small holes in the wall between the parlor and holding area to and threading the cable or pull rope through one hole. Then thread it through a pulley attached to a post in the parlor (keep it level). The pulley then allows it to come down at a right angle, thread through another small pulley attached with a spring in a convenient location from which it can be easily pulled vertically. After threading through the bottom pulley it then goes back to the ceiling to be threaded through another small pulley before taking a right angle and returning through the second hole drilled in the wall. The cable then runs the full length of the holding area to the back wall center where it is threaded through another pulley and finally returns back to be attached to the center of the PVC pipe.

Step 7 may be more easily done before the PVC is mounted on the high tensile wire. It involves connecting lightweight chains at 18" spacings to the PVC pipe so they hang about 3 feet from the ground. A wire connects each of the chains. Then a connection is made to the two eye bolts and a cow trainer is connected to one of the high tensile wires which in effect electrifies the chains. It is important to connect the chains higher than any cow can reach. Thus, cows going through chains cannot break the gate itself.

If wire cable is used it is a good idea to have the plastic/rubber encased for any stray electricity caused by a chain contacting the pull rope. Strong wire clothes line could be used. Also, due to stray voltage concerns, ground the cow trainer/fencer away from the milking facilities.

Many producers have holding areas in NE Iowa that have turns in them. The above crowd gate described can be designed in multiple sections to pull in different directions.

By Larry Tranel, Dairy Field Specialist,  
Iowa State University Extension



## ***NEW Producer Profile***

**Mary and Jason Hettinga,  
Orange City, Iowa  
Sioux County**

### **Goals:**

To start a Jersey cow dairy operation on acreage that has old barn and corral. Herd start-up size was 40 cows, with goal to reach 110 cows in 3-5 years.

### **Existing Facilities Before Improvements:**

- Block barn with hay mow that was used as a dairy barn 30 years ago
- Barn had most recently been used for bull calves; not equipped with milking equipment

### **Improvements Added:**

- Pit parlor, swing milking equipment (used equipment)
- Free stall facility added to east end of old barn
- Feedbunk lean-to and additional freestalls added to north side old barn
- Milk room and bulk tank added to front of old barn
- Cement lined lagoon constructed
- Jersey bred heifers purchased summer 2001



### **Results:**

Construction started summer 2001; freshening and milking started Fall 2001. Hettinga's expected enough cash flow by summer of 2002 to enable Jason to quit his full-time town job. Mary will continue her day job and assist with chores part-time.

The Hettingas, graduates of ISU, saved money by doing the research and planning on their own, and all construction on their own with the exception of the cement work.



## Heat Stress Control Pays Back Quickly\*

Shade, high air exchange rates of 500 to 1000 cfm (cubic feet of air per minute) per cow, airflow over cows of 2.5 to 5 ft per second (fps) and plenty of cool water are all important ingredients in providing hot weather cow comfort.

At air temperatures above 75F, a producing dairy cow must either decrease heat input (get in the shade or reduce feed intake) or increase heat loss (increase respiration rate, stand in a strong breeze, evaporate extra moisture from the skin surface, or find a cooler location.

Cows that are too hot quickly drop in milk production. For every 50 cows that drop 15% in milk production from a 70 pound daily average you lose 525 pounds per day of milk. Assuming hot weather affects the cows 40 percent of the summer (use 4 months) means you lose 25,200 pounds of milk. At \$12.00 per hundred-weight that means \$3000 for the summer.

An additional cost is a cow that gets so hot she dies. Other things affected by hot weather that can add costs include lower conception rates and butterfat tests, and higher somatic cell counts. Another benefit to increased air exchange rates is the milker is much cooler during chore time.

A very efficient method of cooling cows is **tunnel ventilation**. Tunnel ventilation

is pulling air in the barn at one end and exhausting it out the other end. If cows stay in the barn in summer this system will work the best. Two row long barns are the most efficient. It would not take any more airflow to do 100 cows than 50 cows in a two-row barn. Free stall barns are not as efficient because they tend to have open ridges, open ceilings and open eaves. Generally it is more effective to blow air down over the cows in the free stalls or those eating next to the feed table. Generally 48-inch diameter fans are the most efficient for cfm per watt. Use them 40 feet on center and point the installed fan to the floor under the next fan in line to get the right fan slant angle. Locate them about ten foot high or above tractor cab height.

The formula to get the 2.5 fps is 220 ft/min times the height times the width. For example, a 34 foot wide barn with a 8 foot ceiling would need  $220 \times 34 \times 8 = 59,840$  cfm. Base the fan selection on this volume of airflow at 1/8 inch static pressure. Since 48-inch diameter fans average about 20,000 cfm each that would take three fans. This air flow rate could be increased to double the air speed to 5 fps. Anything over this 5 fps air speed does not provide significant comfort or productivity. Generally fans are put in the endwall of a one story barn or in the hay mow of a two story barn. I try to keep two of the three fans in the line with the cow stalls.

I prefer if the barn runs north/south to put the fans in the south end and pull shaded air from the north end. If the barn runs east/west I prefer the fans in the west end and the inlet on the east end. The air should enter the opposite end of the barn at an inlet speed of 400 feet per minute. Take the fan capacity and divide by 400 to get the square footage needed for the air inlet. In the example, it would take 150 square feet. This gives a 4.4 ft high by 34 ft wide inlet.

The vertical wall inlet should use 1 x 4's an angle to keep rain out. It can be covered with a curtain in winter. Again this air can be brought in through the hay mow if available. Tear out about 5 ft of hay mow floor and angle plywood from the inlet top to the hay mow floor. Windows and doors around the barn should be shut except around the air inlet end. You can subtract out this area off the 150 total square feet.

The 48-inch fans will run about \$1000 each. The carpenter work on the air inlet end and installation of the fans could run another 50 percent. The payback could be as low as one year depending on what you factor in the benefits. Where else can you get a payback that quick?

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By Dr. Dan Meyer, ISU Extension Agricultural Engineer, NE Iowa

***“We have dominion over the cows and we will take care of them”***

Bernie Rollin—Colorado State University--speaking of cow comfort

## More Corn Silage in Your Cow's Ration?

Corn silage has been a common feed for dairy farmers for a long time. Usually it is fed in combination with alfalfa hay or haylage. Some farm managers are considering increasing the amount of corn silage in their milking cow rations. There are a number of reasons to consider more corn silage and a few precautions to keep in mind.

Increasing corn silage will allow the dairy manager to increase the energy content of the forage portion of the ration. Corn silage is very palatable, it may be a cheaper source of nutrients than hay or haylage and the advent of the kernel processor has allowed dairy managers the ability to have a high energy forage and yet maintain required effective fibers.

One must keep in mind corn silage shortcomings when considering a ration of mostly corn silage forage. These include low protein content, a profile of amino acids that are not ideal for the cow (low lysine and methionine), low calcium content and a greater storage capacity because of corn silage's higher moisture content.

A very useful research trial done by the U.S. Dairy Forage Research Center used 74 cows in a lactation long trial to compare rations of all alfalfa silage, 2/3 alfalfa silage: 1/3 corn silage, or 1/3 alfalfa silage: 2/3 corn silage (dry matter basis), as 50% of the

ration (dry matter basis). Rations were balanced for protein, rumen undegraded protein (by pass), and energy.

The highest yield was observed from the 2/3 alfalfa: 1/3 corn silage ration for mature cows. (82.3 vs. 79.4 and 80.5 pounds per day) and for first lactation heifers (64.7 vs. 61.6 lbs. per day).

This study really helps us understand the tremendous ability of dairy cows to milk well off of a variety of high quality forages. Some dairy managers will be able to utilize more of one forage than another dairyman because their land resource favors that forage crop.

Two additional management practices may make a higher corn silage ration fit your situation.

The first is kernel or whole plant processing. A kernel processor can result in 2-5 pounds more milk per day especially if the forage is cut at 2/3 milk line or more maturity. Most managers are adjusting the theoretical length of cut (TLC) to 3/4 inch when kernel processing. This practice allows the dairy manager to add more corn silage to the ration and, yet keep effective fiber or acid detergent fiber (ADF) above 18 percent of dry matter.

Another practice is that of increasing the cutter bar height to gain a more energy dense and lower neutral detergent fiber (NDF) forage. Remember, the higher the NDF is, the lower the forage intake. Raising the cutter bar reduces tonnage about 1 ton per each 6 inch rise, decreases ADF 1% point and at a 2/3 milk line harvest percent gain in corn silage increases from 56% (whole plant) to 65% at a 24-inch cutting height.

So in about 80 days should you plan to cut more corn silage for your dairy herd? Your forage inventory, and quality, from hay and haylage will be known then.

If your decision is to increase corn silage here are some strategies to keep in mind: 1) kernel processing will allow you to increase effective fiber and increase the energy of corn silage. These two factors must be considered when balancing the new ration; 2) increasing the cutter bar height will increase energy density. Several dairy managers do this only for the very high producing cows. Easy to do with a bagger on a large dairy, but much harder on a 50 to 70 cow dairy where all the silage is in one structure; 3) consider a minimum of 1/3 alfalfa silage or 4 lbs. of long alfalfa hay per cow per day. This will provide a broader profile of amino acids for more ideal rumen microbial protein production, calcium and an additional source of fiber; 4) when adding additional energy to meet cow's needs, use a higher rumen by-pass source such as dry ground corn or a lower starch source such as beet pulp, soy hulls or even cottonseed.

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By Dale Thoreson, Dairy/Beef & Forages Field Specialist, ISU Extension

## Environmental Regulations in Iowa

Livestock confinement issues were a major part of the Iowa legislative action this past winter. As a result, Senate File 2293, the Livestock Confinement bill, was passed by the legislature and signed into law by the governor.

SF2293 "Regulation of Animal Feeding Operations" has many new provisions, some of which affect new construction but also several elements could affect your current confined animal facilities. We will concentrate on these latter features of the bill that affect current operations.

We need to first remind everyone of what is a "confinement" facility and what is not as this bill applies only to certain confinement sites. Basically, the bill applies to livestock sites that house more than 500 animal units at the site for more than 45 days out of a year.

One of the changes is converting all animal weights to "animal units". One animal unit is a feedlot animal, however, a mature dairy cow is 1.4 and an immature dairy animal is 1.0 animal unit. Swine of 55 lbs. are 0.4; swine from 15 to 55 lbs. are 0.1; sheep and lambs are 0.1; horses are 2.0 animal units; turkeys are 0.018; and a broiler or layer hen is 0.01 animal units.

Beginning on March 1, 2003 manure management plans must be submitted annually by

confined operations over 500 animal units to the DNR and the Board of Supervisors. A filing fee of \$250 is required for the first plan and \$0.15 per animal annually thereafter.

A phosphorous index, along with nitrogen, will be used to determine how much manure can be applied per acre. The legislature allowed livestock producers some time to adopt their operations to these standards. The earliest anyone will need to comply with the phosphorous index is July 1, 2003, that being for someone submitting their first manure management plan after September 1, 2003. For those submitting their original plan before April 1, 2002, they have 4 years to comply. Those submitting an original plan between April 1, 2002 and September 1, 2003 have 2 more years to comply.

DNR will be responsible for establishing air quality standards however, they will not be enforced until December 1, 2004.

Separation distances from restricted areas to spread manure are the same, however, additional areas have been added. The original areas included sinkholes, lake, farm pond, drinking water well, cistern, or ag drainage wells. The distance is 200 feet. Added to the list were creeks, rivers, lakes and DNR designated wetlands. If you want to spread manure closer than 200 ft. to these areas, the manure must be injected or incorporated on the same date of application or a 50 foot buffer strip must be maintained except for drainage wells. This applies to all livestock operations regardless of size.

One change that may affect smaller livestock operation is that any earthen basin must now have a licensed engineer certification before it can be constructed. If you are constructing or expanding a livestock unit there are additional criteria. These include greater separation distances from neighbors, specific concrete design standards and a matrix that will evaluate each site based on several conditions. The boards of supervisors in each county can choose to implement the matrix.

There are many more specific details in this new legislation. There are also many sources of additional information, including the regional DNR offices at Manchester or Mason City, the Iowa State University Extension IMAGE Internet site that is <http://extension.agron.iastate.edu/image/> or your local county ISU Extension office.

### ***Quotes from the 4-State Dairy Conference***

If I had to reduce my management message to just a few words, I'd say it all has to do with variation. (Deming)

**COWsistency** is so important to doing a good job. (Reneau)

## **2002 Farm Bill: Dairy Title**

### **Main provisions:**

1. Establishes a national market loss payment program
2. Extends the milk price support program at \$9.90/cwt. till December 2007
3. Assesses imported dairy products 15cents/cwt milk equivalent for dairy promotion
4. Continues the Dairy Export Incentive Program (DEIP)
5. Makes dairy product inventory reporting mandatory

### **Market Loss Payment (MLP)**

This is a target price-deficiency payment program similar to other agricultural commodity programs. The established target price is \$16.94 Class I milk price at Boston, which is approximately \$13.69 for Class III milk. For each month below this price, dairy producers will receive 40% of the difference. Payment is to be made within 60 days of the end of the month. Payment is limited to 2.4 million pounds of milk annually. For average Iowa dairy producers, this is about 125 cows' annual production. About 89% of Iowa's milk production is eligible to receive the MLP. The program is set to run from December 2001 to September 2005. Sign-up is set to take place from mid-June to September 30, 2002.

Rules on the payment cap have not been set whether the

market loss payment will be paid on the first 2.4 million pounds of milk annually or if it will be paid monthly on a maximum of 200,000 pounds of milk. Nor have rules been set about splitting herds for payment purposes or the type of proof necessary to receive the payments. In previous dairy programs, dairy producers used milk check stubs as production evidence. All milk checks from a dairy entity may count towards payment.

### **Questions remaining for the rules-making process include:**

1. How or if new dairy producers will be eligible for the program
2. What proof of production will be used for payment
3. Whether those ceasing dairy production prior to the enactment of the 2002 Farm Bill will be eligible for payment

Payment amounts for December 2001 to May 2002 milk production have already be set since Class I milk prices are announced prior to that month. The MLP will average \$0.89/cwt for the above months. Future payment amounts are difficult to predict. FAPRI projections suggest the amount will be close to \$0.89/cwt based on milk prices since January 2000. Using 1990-1999 milk prices, the payment would average \$0.63/cwt. FAPRI also projects a 650 million pound increase in milk production due to the MLP, about 0.4% of annual US milk production. Dairy economists contact so far indicate this amount is much too conservative, but are unwilling to make a prediction.

The Congressional Budget has scored the MLP as a \$1.3 billion program. This score is based on a 2 percent annual increase in milk production. So far, milk production has increased 2.4 percent during the first quarter of 2002. UW-Madison dairy economists believe the MLP program cost will be nearer \$3 billion. Cornell dairy economist Stephenson agrees that the production increase and program cost has been understated.

### **Dairy Price Support**

The dairy price support of \$9.90/ cwt. has been extended through December 31, 2007. The Agricultural Secretary has been authorized to change support program purchase prices for nonfat dry milk (NFDM) and butter twice annually, (butter-powder tilt) to minimize program costs.

Currently 961 million pounds of NFDM is in government inventory, nearly double the amount of 1 year ago. By adjusting the NFDM-butter support purchase prices, more or less of one product is purchased by the CCC. It is necessary to move these prices in concert. Butter and NFDM are often produced with milk that isn't needed for more valuable purposes, cheese, fluid milk and soft dairy products. Also NFDM and butter are produced in concert with each other; the butterfat skimmed from milk for NFDM is used to produce butter.

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By Robert Tigner, Farm Management Field Specialist,  
Iowa State University Extension

**Miscellaneous Farm Bill Provisions affecting dairy:**

\* Makes dairy product inventory reporting mandatory. Reporting had been voluntary. Occasionally inaccurate reports of cheese stocks have led to dramatic milk price adjustments in the market.

\* Continues the voluntary processor funded fluid milk promotion program (MilkPEP) which uses the milk moustache image.

\* Continues DEIP which awards commercial US dairy product exporters with dairy commodities or cash to lower the effective price of NFDM, butter or cheese paid by counties targeted for DEIP activity. Bids for DEIP are made for each cash sale which may then be accepted or rejected by USDA.

\* Requires importers of dairy products to pay an assessment of \$0.15/cwt. milk equivalent for dairy promotion and research purposes. US dairy producers argued that since they already pay the assessment, foreign milk should not be a free-rider.

\* Authorizes USDA to establish research, testing and evaluation programs for Johne's disease.

\* Continues the Dairy Indemnity Program (DIP) which pays producers for lost milk production, who through no fault of their own have had milk contaminated by a chemical, toxic substance or radioactivity.

**Upper Midwest Grazing Conference**

**Tuesday, July 30<sup>th</sup>**

**9:15 Registration**

10am "Getting Started Grazing" Panel, Mark Edgington, Cobb, WI; Brian Lantzky, Waucoma, IA, and Mike Tomandl, Medford, WI

12 noon Lunch on your own

1pm "Creating High Sward Density", Andy Hager, UW-Extension and Glenn Harder, Dairy Grazing, Rib Lake, WI.

3pm "Transitioning Corn to Grass", Dave Surprenant, Manteno, IL.

4pm "Fertilizing Grass Pastures", Dr. Jim Gerrish, Univ of Missouri

5pm Break

6pm Dinner (included in conference fee)

7pm Keynote: "Grazing Things to Think About", Dr. Jim Gerrish

**Wednesday, July 31<sup>st</sup>**

**Dairy Breakouts**

8-9:15am "Feeding Dairy Cows on Pasture", Karen Sullivan, NRCS Grazing Specialist, New York

9:45-11am "Genetics Focused on Grazing", Dr. Kent Wiegel, UW-Madison

**Livestock Breakouts**

8-9:15am "Pastured Pigs", Tom Franzen, New Hampton, IA

9:45-11am "Grazing the Cow/Calf Herd", Dr. Jim Gerrish, U of Missouri

**Farm Tours**

11am-6pm Board Buses to Dave Lubben Beef Farm, Monticello; Lee Kurtenbach Dairy, Mechanicsville, IA and Joel Kurtenbach Dairy, Wyoming, IA (Tours Open ONLY to Conference Participants).

**Thursday, August 1<sup>st</sup>**

8:30am "Grazing Begins with the Soil", Mark Kopecky, UW-Extension

9:30am Break

9:45am "Herd Health on Pasture", Dick Wallace DVM, U of Illinois

10:45am Break

11am "Maintaining Healthy Pasture Swards", James Cropper, USDA-NRCS Pasture Systems Research, Penn State University

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

I am registering for:  Entire conference (before July 2<sup>nd</sup> \$75, \$40 for 2<sup>nd</sup> person from same farm; after July 2<sup>nd</sup> \$90, \$45 for 2<sup>nd</sup> person same farm)

Tuesday only  Wednesday only  Thursday only (before July 2<sup>nd</sup> \$45, \$25 for 2<sup>nd</sup> person same farm; after July 2<sup>nd</sup>, \$60, \$30 for 2<sup>nd</sup> person same farm.

I am a student (three day registration fee \$20).

Mail Registration with check payable to:

Dubuque County Extension, c/o Larry Tranel

14742 Hwy 20 West, Dubuque, IA 52003, 563-583-6496, Ext. 14