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The summer is finding us with record milk prices and historic futures prices. It may be an opportunity for us to re-evaluate our long term position in the dairy industry.

For those thinking of joining the dairy industry as a new producer, these prices may afford some great assistance with some start-up costs.

For current producers, the opportunity may lend itself to catch-up, update and/or remodel some of our dairy parlors and housing facilities to keep us competitive in the next 5 years or 20 years, depending on respective outlooks.

For transition minded producers, the opportunity may lend itself to "take the risk" of restructuring the dairy to a larger grazing or confinement operation.

For producers looking to transfer the dairy to the next generation, the opportunity may afford itself to give some great hope for the future of the dairy industry here in Iowa. With water, environmental and other resource issues in other states, Iowa is a prime spot for a continued growth and strengthening of this industry.

In any respect, as you consider options, please keep in touch as we would like to lend our educational assistance where we can. Have a great summer!

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***Dairy Research Briefs from the
Journal of Dairy Science:*** by Dale Thoreson

***Free stall base comparison. Journal of Dairy
Science July 2007.***

Wendy Fulwider and associates at Colorado State University conducted an extensive field study of 113 dairies in 5 midwestern states including Iowa. They compared rubber filled mattresses, sand, waterbeds, and compost bedded pack surfaces with respect to hock joint lesions, cleanliness and somatic cell count. Production, stocking density stall dimensions, bedding amount and frequency were recorded. All bed types were associated with low injury rates if beds were long enough and filled frequently with non-abrasive bedding. Cows on mattresses and waterbeds were cleaner than cows on sand. Mattress cows had the most lesions. As the number of cows showing hock joint lesions and their severity increased the death loss, lameness, culling rate and somatic cell counts increased. There were no differences in milk production. Compost bedded pack cows showed no lesions.

***Pre-calving behavior and dry matter intake identify
cows at risk for metritis. Journal of Dairy Science,
July 2007.***

J.M. Huzzey and associates at the University of British Columbia, Canada observed 101 (32 first calf and 69 multi-calving) Holstein cows 2 weeks before calving and 3 weeks post calving. Continuous monitoring of feeding, drinking and social behavior as well as feed and water intake were measured. The presence or absence of metritis was assessed every 3 days after calving for 3 weeks. Cows with severe or mild metritis had lower feed intakes, feeding time, and water intakes relative to healthy cows before calving and before any clinical signs of infection. One should be able to use these changes in behavior before calving to predict which cows will have metritis post-calving.

***ISU Extension Dairy Team
"Bringing Profits to Life"***

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Producer Profile: Pat and Shiela Brehm, Dubuque County

Pat and Sheila Brehm dairy with their five children ranging from 3 to 17 years of age. Their dairy herd has been growing with their family. In 2003, Pat decided to follow Extension's "Millionaire Model Dairy Farms" path to dairy profitability and the process has served his profitability goals very well.

In 2003, the Brehm's were milking about 60 Holstein cows and grazing "a bit" but after attending Extension's Beginning and Transitioning dairy producer sessions, Pat decided to get more intense with his grazing operation and do some crossbreeding. In consulting with Larry Tranel, Extension dairy field specialist, Pat decided to follow Tranel's model that other producers he knew benefited well from financially. The Brehms now milk 90 cows with a goal of 120-150 cows like the other model farms. The farm went organic last year.

The model farms milk in low-cost parlors and use TMR's, freestalls and most other farm technologies. A major key to the whole system is the low-cost TRANS Iowa parlor which was the latest edition to the Brehm dairy in 2007.



Photo of Pat in his new parlor which with all new equipment and labor was less than \$2,400 per stall. Depending on equipment and labor needs, some low-cost parlors have been built for \$1,200 to 2,000 per stall. Herringbones can be remodeled for much less to go from 6 to 9 stalls on a side in the same space.

"Larry said I couldn't afford to milk in a stall barn or small parlor at my young age. I was milking less than 30 cows per person per hour in the stall barn. Now with my Swing 16 TRANS Iowa parlor, we'll be able to milk over 120 cows an hour with 2 people or 60 cows per person/hour. Also with Larry's recommendations we remodeled a machine shed and put three rows of freestalls in it and we finished it in the fall of 2005 to prepare for the parlor and added cows. More cattle housing is still in the works," Pat said.

When asked what he thought were some defining features of the parlor, Pat mentions the front chop gate, the simple splash guard and kick rail, the floor slopes, the generous amount of light, the unit swing arms and the pre-cooler. "The stall work is so simply and cheap but fits the cow so well that I am really sold on these low-cost parlors. The chop gate allows me to load and unload cows as fast as any rapid exits I've seen.

The Swing 16 TRANS Iowa Low Cost Parlor and holding area cost under \$75,000 and was built into the existing stall barn. This price includes 16 new units with pulsators, take-offs and swing arms; a pre-cooler; a 10 hp milk pump, a variable speed milk pump, a used 3" line and stainless steel milk jar. A variable speed transfer motor on the milk jar allows the milk to pass through the plate cooler slower to cool better, Pat adds.

Pat credits Extension for being of great assistance with instructing the builders on the importance of the TRANS Iowa parlor stalls design details like the sloped splash guard, the chop gate, the 4' entrance gate and swing arms. "They had a few interesting discussions that I'm glad Larry was there to provide recommendations. A 14' garage door opens the parlor to the cows in the holding area which is a feature Pat loves. It's well lit, shiny and very open.

Pat says "these TRANS Iowa parlors are a great option for these old stallbarns and old herringbone parlors."



A detailed look of the splash guard with an 8" offset from top to bottom, putting the cow real close to the operator. There is a kick rail for safety. The open 4' entrance in the back and the chop gate in front really help throughput. Simple brisket rail in front. "This is the ultimate design for a parlor," says Pat.

For more information and videos on TRANS Iowa Low Cost Parlors, visit the following website: <http://www.extension.iastate.edu/dubuque/info/Dairy+Publications.htm> and scroll down. TRANS Iowa Parlors are:

"TRANSforming the Iowa Dairy Industry, one parlor at a time."

Dairy Cattle Reproduction Systems 2007 Minnesota Dairy Health Conference

by Chris Mondak, ISU Extension Dairy Specialist

Paul Fricke, University of Wisconsin Extension Specialist in Dairy Cattle Reproduction, presented a 3 hour overview to veterinarians, summarizing current trends and recent research in dairy cattle breeding systems. Below is a summary of key points:

Voluntary Waiting Period – Previous industry recommendation to plan 1st breeding post-calving at 40-45 DIM is too early according to recent research. Dr. Fricke reported that 70 DIM is now the recommended target date for 1st breeding post-calving, and results in 32% conception rate rather than 28% for early VWP. Researchers are finding that cows are likely to not be ovulating yet at 40 – 50 DIM, and that by 70 DIM, fewer cows are anovular, resulting in the better conception rate.

Improving Conception 1st Breeding- After summarizing data on the numerous synchronization programs now commonly used on dairy farms (Ovsynch, Co-Synch, ReSynch, Pre-Synch), Fricke states that his review of the research indicates that conception rate is 29% for Ovsynch and 43% for PreSynch/Ovsynch combination, leading him to favor use of a combination PreSynch/Ovsynch program for cows' 1st breeding post-partum. Assuming use of 70DIM as target 1st breeding date, the PreSynch/Ovsynch schedule would start cows on the schedule when they are approximately 50-56DIM. This is the timeline of action steps in this synchronization plan:

Begins approximately 50 DIM -- PGF (14 days)
PGF (12-14da) GNRH (7da) PGF (2da) GNRH
(16 hrs) AI Breeding -- Ends approximately 70 DIM

Identifying Open Cows After 1st Breeding – Can You Preg Check Too Early? – Fricke reported results from recent field trial research performed on commercial dairies to investigate best time to check cows for pregnancy after 1st breeding. The primary goal of pregnancy checking is to identify those cows that are still open, and to take actions to re-enroll them into a synchronization program to re-breed them as soon as possible. In his trial, cows were scheduled to be examined for pregnancy via ultrasound on either Day 19, Day 26, or Day 33 post-breeding. The results showed that delaying pregnancy exam and initiation of ReSynch to Day 33 was better than the earlier checks and synch re-start at Day 19 or Day 26. Fricke explained normal pregnancy loss early in pregnancy (10-11% is normal):

“Pregnancy loss diminishes the benefit of early pregnancy diagnosis in lactating cows in 2 ways. First, because of the high rate of pregnancy loss that occurs early, the magnitude of pregnancy loss detected is greater the earlier after TAI (timed AI) that a positive diagnosis is made. Thus, the earlier that a pregnancy is detected after TAI, the fewer non-pregnant cows are identified to which a management strategy can be implemented to resynchronize them. Second, and more important, cows diagnosed pregnant earlier after TAI have a greater risk for subsequent pregnancy loss compared to cows diagnosed later after TAI. If left identified, cows diagnosed pregnant early after TAI that subsequently lose that pregnancy reduce reproductive efficiency by extending the interval from calving to the conception that results in full-term pregnancy.”

In short, a good pregnancy checking schedule would place 1st pregnancy check between Day 33-39 post-breeding, and would be followed with a pregnancy confirm check at about Day 68. Cows found open at these pregnancy checks could be placed in ReSynch schedule in order to be re-bred as soon as possible.

For more information about his presentation given at the Dairy Health Conference, contact Chris Mondak at cmondak@iastate.edu.

CLEAN, SCREEN, & TURN DOWN THE HEAT (focus on fresh cow mastitis – esp. summer) By Leo Timms, Extension Dairy Specialist

Fresh cows and heifers present the highest risk animals for mastitis. Summertime, especially, amplifies these risks as hot, humid weather increases mastitis germ loads as well as decreases animal immunity due to heat stress, lower dry matter intake, and other stressors. There's no better time to focus and apply a mastitis screening procedure at calving.

CLEAN (and dry)!!: Since germs cause mastitis and have to get on and into the teat, minimizing germ loads in transition and fresh cow areas is a must. Bedding here should be the cleanest, driest possible. Hot, humid weather tends to make bedding wetter and grow germs faster, so more frequent cleaning and bedding may be needed. Also, make sure alleys are scraped more often to decrease contamination from feet (dirty feet makes dirty bedding)! Decreasing germs gives greatest chance for success!

SCREEN: Having an active **fresh cow CMT monitoring system** in place (and appropriately interpreting it to make proper decisions) is the key to know if your transition mastitis control is working and separate that from problems that may occur after calving and result in later mastitis or a high SCC on first DHI test. **Using a CMT will make you \$\$\$\$\$!**

- ***It takes time and money and I thought all fresh cows and heifers have high SCC so why run a CMT?*** This is an old, false tale. In well managed herds, > 80-90% of animals and quarters can be CMT – (low SCC) on day of calving or certainly within 2-3 days. This is the best way to show yourself that you can freshen animals without mastitis and that your pre-fresh mastitis prevention strategies are working. Plus the test is simple and easy to run, takes < 1 min., and costs pennies. Great investment for fresh cows and heifers! **So run the CMT religiously!**
- ***What scale should I use (neg, trace, 1, 2, 3) as there are different degrees of gelled milk (SCC)?*** For fresh cows, the best results are to classify as no gelling or gelling. This gives the best accuracy and is much easier. You may want to mark really thick gelled samples (hardly move in the paddle) as they are more apt to be infected / show a future clinical problem.
- ***What does a negative CMT mean?*** **UNINFECTED and no mastitis (95+% accurate!).** Use this to monitor prevention. You should see lots of animals with negative CMT! This is your pat on the back! It shows you've prevented mastitis problems at calving!
- ***What does a positive CMT (CMT+ or gelled) tell you?*** It tells you the animal has a high SCC and has sent somatic cells to the udder to fight or ward off a conflict (infection)!
- ***Does a CMT + mean they are infected?*** Not necessarily at that moment. Most animals get germs on and in their teats prior to calving as teats shorten and swell, and sometimes leak. The animal uses her SCC to ward off that infection and stay healthy. **50-60% of the time the animal is CMT + after calving, they have already cured the infection (SCC drop in < 2 days)!**
- ***Does CMT pick up infected animals?*** Yes, on **calving day** 70-75% of infections will gel the CMT paddle. By **day 3 post calving**, CMT picks up 85%?
- ***When should I run the CMT?*** I recommend day of calving. It may be slightly less accurate than day 3 post calving (a few more false positives or cured cows with high CMT) but it allows seeing problems earlier. It also works on colostrum (stir with finger).

- ***What should I do when I see a CMT + animal?*** **First, use it to monitor prevention.** Especially if you see a group of high SCC animals, turn your attention to transition cows/ lots and evaluate prevention! Make sure to avoid problems in the next group. **Second, mark the cow so everyone is aware this cow has a high SCC and can get special attention** (watch at feedbunk, milkout properly). Most times, TLC works! **Finally, consider treatment if the cow is clinical or you know she is infected (culture early). Make sure it's a germ where treatment will be cost effective!** Again, many CMT + are cured so treatment cost w/ no return and a lot of risk (antibiotics).

TURN DOWN THE HEAT: You've kept the animals as clean as possible, yet your CMT screening still shows problems. How can this be? The other side of disease is your immunity and a few germs can go a long way if your immunity is depressed. Keys to enhanced immunity are providing conditions that maximize animal comfort and dry matter intake and minimize other outside stressors.

A major stressor for these animals is **heat stress**. We often times don't think about them because they aren't milking so we don't see the production loss. Take a step back and think about these cows though. First, they are a mini inferno already as that late pregnancy fetus is growing fast and producing a lot of heat. Couple this to external heat stress and we see larger decreases in dry matter intake, more body weight loss (or less gain), and decreased immunity. The end results are more fresh cow problems, but even if you avoid them, it's usually less milk and slower breed back because of the body weight loss. The key is to provide the best conditions for eating and drinking and then getting the animal to use those nutrients to feed the fetus and cow's immunity, not feed the fire or inferno. **So heat abatement (especially fans) for transition cows and heifers is A MUST. It's an investment you can't afford to be without!!** Properly placed fans should be enough most days. Some want to use sprinklers and that may be fine some days but water also increases mastitis risks so this must be carefully managed and monitored. **Cool cows are comfortable cows so make those transition cows and heifers comfortable by TURNING DOWN THE HEAT!**

CLEAN, SCREEN AND TURN DOWN THE HEAT (minimize stressors) is the key to fresh cow mastitis in summer and all year. Get a jump on it now and use your screening system (CMT) to prove you can make a difference!

HAPPY SUMMER!

CENTRAL PLAINS HOSTS DAIRY TOUR

This tour will visit nine dairies in the I-29 Corridor on July 12th and 13th. The tour dairies include:

*NorSwiss. – a 200' bedpack barn turned into a compost barn for close-up cows using 2" finely (tub ground) chopped straw as the carbon source, aerating 1x/day.

* Coteau Winds Holsteins -- 52-cow dairy has exceptional facilities that include a feed center and calf raising barn attached to a tie-stall barn.

* Midwest Dairy Institute -- Midwest Dairy Institute operates a 1.2 million gallon methane digester. MDI has a 40-stall rotary parlor with 6 and 4-row freestall barns.

* Victory Farms -- a 250 x 140 foot steel compost barn with a drive-through center alley. They bed each side of the barn with new sawdust every 25 days and stir the compost daily with a digger on a 45-horsepower tractor.

* MoDak Dairy/MoDak Feeds, Inc. -- Price haylage, silage, TMRs, distillers grains, sweet bran and other ag processing byproducts and see the latest in forage harvesting, trucking equipment and feed center design.

* Lazylot -- a 70-cow tie-stall dairy with a double six parlor to 400-cow dairy with sand-bedded freestall barns and a double 10 parlor that is expandable to a double 12

* Providence -- a barn with a lot of light and fresh air with 500 cows in a 600 foot Coverall hoop barn. The farm sports a gravity lane to separate the sand from the water.

* Old Tree Farms -- The 50 acre site with 900 cows was already permitted for 1,400 cows with cows milked in a side by side double 10 parlor with rapid exit, expandable to 20. with a basement underneath.

* Drumgoon Dairies -- Facilities include a 300- by 500-foot cross ventilated barn that houses 1,400 cows. The dairy has a double 24 rapid exit parlor, a single 7 point hospital parlor, electronic ID sort system and a gravity sand separation system. Ninety percent of their cows are heifers and 60% are cross breeds milking 3x per day.

Reserve a seat. Tour is July 12-13. Cost is \$80 for Central Plains Dairy Association members and \$150 for non-members. All family members and employees from dairy qualify for member rates at the tour. Industry memberships are also available. The fee covers transportation and meals. Lodging is not included. The headquarters hotel is the Best Western Ramkota. Call the hotel directly at 605-886-8011 to make room reservations. See www.centralplainsdairy.com for more information and a tour brochure.

To register contact Kathy Tonneson at 218-236-8420 or Kathy@centralplainsdairyexpo.com.

Upper Midwest Grazing Conference

August 1st and 2nd,

**Best Western Midway Hotel, Dubuque, IA
563-557-8000 for reservations**

- 10:00 **Using By-Product Feeds to Supplement Pasture** by Dr. Dan Faulkner, (U of IL) and Dr. Dave Combs (U of WI)
- 11:00 **Choosing Varieties for Forage** by Jim Morrison (U of ILL)

Dairy and Livestock Breakouts after LUNCH :

- 1:00 **#1 Constructing a TRANS Iowa Low Cost Parlors** by Larry Tranel (ISU Extension)
- #2 Pasture Finishing Beef Cattle** by Dr. Jeff Lehmkuhler (U of WI)
- 2:00 **#1 Organic Milk Production** by Jim Heisner, WI organic dairy producer
- #2 Internal and External Parasites** by Dick Wallace, DVM (U of IL)
- 3:00 **#1 Dairy Cattle Crossbreeding** by Dr. Kent Wiegel, (U of WI)
- #2 Meat Goat Production** by Dave Wachter (U of WI)
- 6 :00 Dinner and Speaker : **Conservation Provisions in the Farm Bill** by Ellen Huntoon, Staff Assistant to Senator Tom Harkin

Thursday, August 2nd Farm Tours (bus leaving hotel at 8:30 am)

- 9:00 TRAN LAND Dairy, Cuba City, WI TRANS Iowa Low Cost Parlor and organic production
- 10:30 UW Platteville Pioneer Farm, new construction and robotic milker
- 2:30 Gene Scriefer farm, Dodgeville, WI, sheep/beef and high quality forage production.
- 5:00 Arrive Back at Best Western Midway Hotel

Registration is \$75.00 per person before July 18, \$90 thereafter. Students registration is \$20. For a brochure or to register call 608-723-2125 or send to Grant County Extension, Box 31 Lancaster, WI 53813 or email dave.wachter@ces.uwex.edu .

To find a brochure on the web, click on:
www.cias.wisc.edu/uppermidwest

More about Corn Co-Products

by Dale Thoreson, ISUE Dairy Field Specialist

Our last newsletter discussed two methods of making ethanol from grain, the products made and compared Distillers Grains (DG) and Corn Gluten Feeds (CGF). This article will concentrate on the economics of corn co-products for dairy and touch again on "rules" for use.

Robert Wisner, ISU Extension grain marketing economist, estimated if current ethanol building trends continue there will be 63 plants in Iowa plus 11 just outside of our borders by 2012. Iowa currently has 34 ethanol plants. Dr Wisner used those numbers and similar data from the United States to estimate DG production at 46.8 million tons if 5.5 billion bushel of corn are used for ethanol.

What is the supply/demand situation given the U.S. livestock industry numbers? Wisner estimates 7.1 million tons will be fed to fattening cattle (20% of dry matter), 6.13 million tons to dairy (20% of dry matter), and 6.72 million tons to hogs (15% of dry matter) with a total demand of 20 million tons annually. Thus, the ethanol industry will need to market over half of the DG produced for purposes other than livestock feed! This should mean that DG will be a very economical feed ingredient.

What about now? The June 22, 2007 USDA reported prices for Iowa ethanol plants (http://www.ams.usda.gov/mnrreports/nw_gr111.txt) were corn at \$3.65 per bushel, Dry Distillers Grains at \$105 per ton, Modified Distillers Grains at \$45 per ton and wet Distillers Grains at \$32 per ton. That gives us a value per pound of dry matter at \$.077 for corn, \$.058 for DDG, \$.045 for MDG, and \$.048 for WDG.

On that day all of the distillers' products were selling for less than corn on a dry matter basis. For dairy we know that DG are equal to corn in energy, higher in crude protein and by-pass protein (rumen undegraded protein RUP), higher in phosphorous and fat than corn. Yes, we need to compare DG to other protein sources such as soybean oil meal and blood meal (by-pass protein), but if it is cheaper than corn from an energy standpoint, it likely will be very price competitive with other protein sources.

We still need to keep in mind the DG feeding limits for dairy. Those being a maximum of 20% of the ration dry matter; keep the sulfur under .05% of the ration and make sure you have adequate effective fiber. Milking rations should have a minimum of 19% acid detergent fiber (ADF) and 30% neutral detergent fiber (NDF).

Distillers' grains do not count as effective fiber. And keep the total fat in the ration under about 5%.

It certainly looks like we will have very adequate supplies of DG in Iowa. We need to explore ways to include them in our dairy rations.

Farm Leasing Meetings -- 2007

Jul 19th, Waverly Community Center, 1:30 pm
Jul 23rd, Freedom Bank, Monona, 1:00 pm
Jul 24th, VFW, Osage, 9:00 am
Jul 31st, Calmar, Dairy Center, 7 pm

Aug 1st, Hancock Extension Office, 2:30 pm
Aug 2nd, Fortress Bank, Cresco, 2 pm and 6 pm
Aug 7th, Hawkeye Comm. College, Waterloo, 1:30 pm
Aug 8th, City Hall, Dyersville, 1:30 pm
Aug 9th, NICC, Mason City, Time TBD
Aug 14th, Roseville, IA, 1:30 pm

For more information on these farm leasing meetings, call Robert Tigner at 641-394-5415

Other Dairy Meetings:

July 8, State 4-H Dairy Judging contest, Des Moines
July 9, Iowa State Fair Youth Dairy Show, Des Moines
July 10-11 Iowa State Fair Open Dairy Show, Des Moines

August 1-2, Upper Midwest Grazing Conference, Best Western Midway Hotel, Dubuque

September 6, Tri-State Ag and Dairy Expo, NE IA Dairy Foundation, Calmar
September 15, Iowa Dairy Classic, Fayette County Fairgrounds, West Union
October 2-6, World Dairy Expo, Madison, Wisconsin

Estate Planning Workshops with Roger McEowen, Director of the ISU Center for Agricultural Law and Taxation, are scheduled for August 7 at NCC in Sheldon and August 8 at WIT in Cherokee. Workshops will run from 9 am to 4 pm with registration fee of \$50 per person, \$75 per couple which includes noon meal. To register or for more information call 712-957-5045 or 712-224-6196.

DCHA (Dairy Calf and Heifer Association) Annual Conference will be in our region at Rochester, MN, March 31 – April 3, 2008. Please mark your calendars if interested.

Dairy Crossbreeding—Deal or No Deal?

ISU Extension's "Millionaire Model Farms" are practicing crossbreeding. Is the crossbreeding deal a good deal for your dairy? The answer "depends" on many variables. Do you want to maximize milk production per cow? Then the answer is "no deal" to dairy crossbreeding as straight Holsteins produce around 7-10% more milk per cow than their crossbred counterparts. Do you want to maximize combined fat and protein per cow? Then the answer is probably also "no deal" at this time as straight Holsteins produce an estimated 3-5% more fat plus protein in recent research data. On the surface, it sounds like crossbreeding is a no deal situation as a conscious decision must be made to sacrifice milk and component production per cow.

However, there are many other variables to account for in the decision. For example, recognize an estimated 6% reduction in dry matter intake in the crossbreds with equal feed efficiency compared to a pure Holstein. This 6% dry matter intake reduction (Holstein-Jersey cross) may equate to about three pounds of dry matter per cow per day or about .65 ton of dry matter per cow per year. The cost per cow of feed savings is only about \$75 which can compensate for 625 pounds of \$12/cwt milk or 3% of the milk lost versus pure Holsteins. Thus, some of the lost milk is recovered in feed cost savings. Economic values also need to be put on other traits that become a part of the equation.

If you want a cow that not only eats less but is smaller, lasts longer, breeds better, has less days to first service, less calving difficulty, less stillbirths, and better overall general health (less vet bills), then crossbreeding may be a "good deal" for your dairy herd. And, in milk markets where producers are rewarded with adequate premiums for fat and protein, first generation crosses of certain breeds may exceed pure Holsteins for lifetime net profit. So, if lifetime net merit is your primary goal along with an "easier keeping" cow and you are adequately rewarded for milk components, then yes, crossbreeding can be a good deal. Dairy producers need to understand that profitability reaches far beyond pounds of milk produced per cow and crossbreeding, if managed correctly, may be a means to improve profitability.

Crossbreeding is a mating system that compliments genetic improvement. The average Holstein has about 5.2% inbreeding as of 2006 with an estimated increase of 0.1% per year. Crossbreeding counteracts inbreeding and may be a good deal for producers seeking ways to reduce effects of inbreeding on their dairy herd. The sires selected are as or maybe even more important as crossbreeding! Below is data to consider:

Table 1. First Lactation Milk Production (actual 305 with 2x milking)

	Holstein	Montbeliarde x Holstein	Scandinavian Red x Holstein
Number of Cows	380	494	328
Milk (lbs)	21,801	20,305**	20,499**
Protein (lbs)	777	743**	756
Fat (lbs)	677	645**	655**
Fat + Protein (lbs)	1,454	1,388**	1,411*
% of Holstein		-5%	-3%

*Statistically significant difference from pure Holsteins ($p < .05$)

**Statistically significant difference from pure Holsteins ($p < .01$)

The total fat plus protein difference above was maintained during the first three lactations of the above cows. Importantly, no adjustment was made to production differences in days open during the current lactation (pregnancy status) of the cows. Cows with shorter days open are penalized for 305 day production and cows with long days open or that do not become pregnant have inflated 305 day production. Thus, production and fertility must both be included, along with other important traits, in selection indexes to determine total merit of cows. Crossbred cow groups had significantly less calving difficulty than pure Holsteins as listed in Table 2.

Table 2. Calving Difficulty and stillbirths for breed of dam at first calving

Breed of Sire	No. of births	Calving difficulty	Stillbirth
		-----%-----	
Holstein	371	16.4	15.1
Montbeliarde	158	11.6	12.7
Scandinavian Red	855	5.5*	7.7*
Breed Group of Dam			
Pure Holstein	676	17.7	14.0
Montbeliarde-Holstein	370	7.2**	6.2**
Scandinavian Red-Holstein	264	3.7**	5.1**

*Statistically significant difference from pure Holsteins (p<.05)

**Statistically significant difference from pure Holsteins (p<.01)

Table 3. Reproduction traits and survival of crossbred first-lactation cows

	Pure Holstein	Montbeliarde-Holstein	Scandinavian Red-Holstein
No. of cows	536	375	261
Days to 1 st A.I.	68	65*	66
1 st A.I conception rate	22%	31%*	30%*
No. of cows	520	371	257
Days open	150	131*	129*
Survival to 305 days, %	86	92*	93*

* Different (P<0.05) from pure Holstein

Each of the above items, along with others not depicted here have an economic value to consider and those economic values may be different for each herd as they affect calving strategies, labor efficiency and veterinary, breeding and other expenses. A 7% increase in survival to 305 days would reduce your cull rate and increase your herd's net worth. Thus, consider the total package of crossbreeding closely.

Then, remember the above research is related to F1 crosses. Preliminary data on 3-breed crosses was very similar to 2 breed crosses as depicted in Table 4 below.

Table 4. Actual 305-day production during first lactation of specific breed combinations.

Breed Combination	No. cows	No. sires	Milk	Fat	Protein	Fat+Protein
			------(lb)-----			
2 breed crossbreds						
Montbeliarde/Holstein	366	32	20,793	773	667	1,440
Scandinavian Red/Holstein	162	15	20,834	772	671	1,443
3 breed crossbreds						
Montbeliarde (sire) x (Scandinavian Red/Holstein)	43	9	20,857	784	679	1,435
Scandinavian Red (sire) x (Montbeliarde/Holstein)	86	10	19,421	730	636	1,366

The average extent of heterosis during the first four generations of 2, 3 and 4 breed crossbreeding systems is 72%, 91% and 97% respectively. Moving to three breeds increases average extent of heterosis by 19% and to a fourth breed another 6% or 25% more heterosis for four breeds over two breeds. Crossbreeding systems using only two breeds limit the impact of heterosis and crossbreeding systems using more than three breeds may limit the impact of single breeds of high merit for specific needs.

Heterosis is a bonus that dairy producers can expect in addition to the positive effects of individual genes obtained by using top A.I bulls within breed. The bonus should be about 5% for production and at least 10% for mortality, fertility, health and survival and heterosis comes on top of the average genetic level of the two parent breeds. A color tagging system is used to identify which breed the animal gets bred to next using three or four different colors depending upon use of a three breed or four breed cross.

Producers not considering crossbreeding should take a very close look at the economic value of open days, cull rates, cow longevity, calving difficulties and death loss and the cumulative economic and labor efficiency values. In addition, consider how these factors relate to your growth or lack of growth in herd size. Also, producers not crossbreeding should pay utmost attention to inspection of pedigrees when mating bulls as inbreeding effects are not readily visible but are increasingly real in pure breed herds.

What about Holstein-Jersey Crossbreds?

Results from a Minnesota trial tend to compare relatively well with the trials above, except for calving and stillbirths. Milk volume was 7% higher in Holsteins compared to Holstein-Jersey crosses, fat was equal and fat plus protein was 2.7% higher in purebred Holsteins. The Holstein-Jersey crossbreds had 10 days fewer to first service, 78 versus 88. Average days open were 23 days less for the crossbreds, 136 versus 159. There were no differences in calving difficulty or in rates of stillbirths. The crossbred heifers had 6.4% less dry matter intake with no differences in feed efficiency.

Results from a Wisconsin study (Shaver) comparing groups of 140 cows on a single farm suggests Holstein-Jersey crosses are holding their own economically relative to pure Holsteins. The results showed an \$18/cow/year advantage to the crossbreds when health differences are accounted for and if the milk price is based on cheese yield. The Holsteins averaged 51 lbs. of dry matter intake per day and produced 82 lbs. of milk while the crossbreds averaged 46 lbs. lbs. of dry matter intake and produced 70 lbs. of milk. Correcting for solids, the milk difference was 75 lbs. for Holsteins and 70 lbs. for the crossbred cows. Income over feed costs on a cheese yield basis was \$6.99/cow/day for Holsteins versus \$6.73 per cow/day for the crossbreds. When cheese yield based income over feed cost was adjusted for days open, health disorders and culling, the crossbreds outperform the Holsteins by \$77 per cow/year. Also, consider heifer rearing costs. Shook and Combs (2003) calculated replacement cost for jerseys substantially lower for Holsteins. Thus, for a crossbred cow, heifer rearing costs would probably be less than for a pure Holstein.

In Sum, Is Crossbreeding a Deal or No Deal?

The bottom line is crossbreeding can help achieve goals thanks to heterosis and the offset of inbreeding.

- Crossbred cows lost 7-10% of milk production and 3-5% of fat plus protein production.
- Crossbreeding often results in a smaller cow that eats less feed which can compensate for an estimated 3% of the lost milk. Less manure is also produced with lower heifer rearing costs probable.
- Crossbreds may fit better in grazing systems, but don't overlook their benefit in confinement, too.
- Crossbreeding benefits many non-milk yield traits as a means of improving profitability so consider these non-milk production traits whether you crossbreed or not.
- Remember, the A.I bulls you choose to use may perform different than the bulls or breeds used in these studies so choose traits of proven sires that will meet your breeding objectives.
- If you are a grazer, the best bulls rank quite similarly whether you are in confinement or grazing.
- When selling heifers, bull calves or cull cows, the dairy and slaughter value of crossbred cattle may be less per head, depending on the breed used.
- Crossbreeding can increase the net lifetime merit of your dairy herd if managed correctly.
- The use of three or four breed rotation further maximized heterosis relative to the F1 cross.
- Crossbreeding is a mating system that compliments genetic improvement.
- The sires selected are as important as the decision to crossbreed!