WEST CENTRAL®
DEMONSTRATING THE DIFFERENCE
PO Box 68 · 406 1st Street · Ralston, IA 51459

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QUALITY CORNER: A LOOK INSIDE THE DAIRY NUTRITION PLUS PRODUCT LINE

Innovation

- *Proven history of commercializing research*
  - *SoyPlus began production in 1984*
  - *SoyChlor began production in 1997*
  - *PasturChlor began production in 2011*
- *Progressive investments to add value for cooperative members*
  - *Crush facility began production in 1940s*
  - *Biodiesel began production in mid 1990s*
- *Patented bypass protein manufacturing process*

Knowledge

- *Full-time PhD nutritionist on staff*
- *Strong relationships with leading universities*
- *SoyPlus has been used in more than 200 academic research trials*
- *Continued investment in research*
- *Expert grain marketing analysis available*

Consistency

- *Routine and rigorous product testing*
- *400+ monitoring points for unsurpassed reliability*
- *65+ peer audits annually*

Quality

- *Proven results*
- *ISO certification*
- *HACCP certification*

Efficiency

- *Client-convenient logistics and service after the sale*
- *Reliability via soybean supply chain (seed to harvest to manufacturing) and access to soybeans from more than 3,000 farmer-members*
- *Full-time logistics team to support customers*
- *Dedicated rail fleet of more than 400 cars*

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SOYPLUS®
SOYCHLOR®

DAIRY NUTRITION PLUS NEWSLETTER

*PHOTO COURTESY OF **BOB COLLIER, UNIVERSITY OF ARIZONA***

IN THIS **ISSUE**

MAKE PLANS NOW TO COOL DRY COWS THIS SUMMER

The evidence keeps mounting. Cooling dry cows pays you back. Not only does it improve the cows' milk production and reproductive performance in their next lactation, but it also makes a huge difference in the growth and performance of their calves well into adulthood.

New research confirms that late gestation heat stress in dairy cows results in decreased dry matter intake, decreased milk production, smaller calves, decreased reproductive performance, and it changes animal behavior.

"The success of the transition period – the last three weeks of gestation through the first three weeks of lactation – effectively determines the profitability of the cows during lactation," says James Drackley, professor of dairy nutrition at the University of Illinois. Environmental limitations, such as heat stress, and nutritional management during this critical time can impede the cows' ability to reach their maximum milk production.

And when you add in the on-going research from the University of Florida on the effect of late-gestation heat stress on calves and their subsequent performance; it makes a strong case for cooling dry cows. (For more on the Florida research, please see "Cooling Dry Cows Yields More Productive Heifers," in this newsletter.)

Behavioral changes

This latest research on the effects of late-gestation heat stress was conducted at the Farm Animal Research and Teaching Unit of the Isfahan University of Technology in Iran in conjunction with the University of Illinois. During the 21-day treatment period, direct cooling of animals with fans and sprinklers was used for heat abatement. Cows were housed in sand-bedded stalls.

Researchers compared the behavioral changes of prepartum cows from heat stress during the last three weeks of gestation to herdmates that were cooled with fans and sprinklers from 7 a.m. to 5 p.m. The heat-stressed cows spent less total time eating, less time ruminating, and less time lying down.

Even though heat-stressed cows spent less total time eating and ruminating, they ate more meals per day, and had more rumination bouts per day. Those rumination bouts were just shorter in length than the cooled cows' rumination bouts.

When the time cows spent eating, ruminating and chewing was evaluated based on time per pound of dry matter intake, we found that the results for heat-stressed and cooled cows were similar. "In other words, the cows chewed the same amount for every pound they consumed, but they spent less time eating so they had lower dry matter intake," explains Drackley. "And, because cooled cows ate more and spent less time standing, they spent more time ruminating.

We concluded that prepartum dairy cows adapt to heat stress through slightly increasing the number of meals per day but reducing the duration of those meals." The chart below details the results which were measured at 10 days before expected calving date:

	Heat Stressed	Cooled
Eating Time (Min/Day)	147.4	166.2
Rumination Time (Min/Day)	243.2	282.5
Standing time (Min/Day)	474.0	390.4
Meals		
Bouts/Day	11.4	10.2
Minutes/Meal	14.2	16.8
Rumination		
Bouts/Day	13.1	11.3
Bout Length, Minutes/Meals	19.4	25.5
Total Chewing Time (Min/Day)	390.6	448.7
Drinking Time (Min/Day)	8.1	7.6

Cooled cows produce more milk

Despite that behavioral adaption, heat-stress during late gestation still takes a toll on the subsequent lactation. Cooled cows produced, on average, 9 pounds more milk per day than heat-stressed cows. Milk production, when adjusted for components, was also greater for cooled cows. And during the 180-days postpartum studied; cooled cows had a greater feed efficiency. The chart below details these findings:

	Heat Stressed	Cooled
Milk Production (lbs/day)		
Actual Yield	89.29	98.33
3.5% Fat Corrected Milk	82.67	93.03
3.5% Fat and Protein Corrected Milk	83.55	94.14
Postpartum DMI (lbs/day)	40.12	41.89
Feed Efficiency		
Fat Corrected Milk/Dry Matter Intake	2.06	2.22
Prepartum DMI (lbs/day)	30.20	34.17

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MAKE PLANS NOW TO COOL DRY COWS THIS SUMMER *continued from page 1*

Heat stress during the last three weeks of gestation decreased actual dry matter intake by almost 4 lbs/day. That's a lot of lost intake; especially during the transition period when you know that every bite counts to help cows make a successful transition.

Heat stress also decreased dry matter intake as a percentage of body weight before calving. But after calving, dry matter intake did not differ between the two groups.

On the reproduction side, the biggest difference between heat-stressed and cooled cows was the number of services per conception. Cows cooled during the last three weeks of gestation required an average of 1.9 services per conception. Cows that were heat stressed before calving required 2.2 services per conception.

As shown in other studies, heat stress also resulted in calves that were almost 6 pounds smaller than those born to cooled cows. In addition, the cooled cows produced better quality colostrum, although the amount of colostrum was not significantly different.

Get started today

When it comes to helping cows make a good transition the little details matter. Using a negative DCAD diet, testing urine pH, testing for elevated ketones, monitoring rumination time, actively cooling your dry cows to minimize heat stress; all of these things deliver small improvements in cow health and performance. Apply the insights that recent research has given us to make each cow's transition a successful one.

BEYOND BYPASS

Feeding Higher Fat Soybean Meal Pays

New research shows that changing to a higher-fat soybean meal could improve dry matter intake and milk production without sacrificing milk fat.

In the study, extruded soybean meal containing 10 percent fat was substituted for solvent-extracted soybean meal containing 1.8 percent fat in lactating dairy cow diets, explains Alex Hristov, professor of dairy nutrition at Penn State University. Dry matter intake increased by 2.65 lbs/cow/day and milk production climbed 7.5 lbs/cow/day for cows fed the high-temp extruded soybean meal with 10.9 percent fat. (Total fat in the diet was 4.3 percent on a dry matter basis.) Milk fat, milk protein, and feed efficiency did not change.

While increased fat in the diet is part of the response, it alone did not drive the results. "I think palatability is the key here," says Hristov. "The combination of increased palatability due to higher fat content; increased energy density in the diet due to additional fat, and increased rumen undegraded protein supply from the heat treatment during processing led to these results." Improved palatability led cows to eat more. It's that increase in DMI that drove the increase in milk production.

Some producers and nutritionists are hesitant to formulate a diet with more than 3 or 4 percent total fat. However, lactating cows can benefit from up to an additional 2 to 3 percent total fat in the ration, he says. The product used in the research was a 10 percent fat extruded soybean meal. But there are other heat-treated soybean meal products with up to 6.6 percent fat, such as SoyPlus, that could still deliver an increase in DMI and milk production.

It really depends on the product you select, but producers may feed a lower fat heat-treated soybean meal and still get the benefit of increased intake and milk production, says Hristov. The role of RUP should not be underestimated. "The 6.6 percent fat product is an excellent by-pass protein soybean meal product. I would expect improved cow performance when using it to replace solvent-extracted soybean meal in the diet."

In the Penn State study, the key was the palatability of the product and the increased dry matter intake. If it is not highly palatable it will not drive increased dry matter intake to see positive results.

To read the full paper "Extruded Soybean Meal Increased Feed Intake and Milk Production in Dairy Cows," in the *Journal of Dairy Science*, please go to:

http://dx.doi.org/10.3168/jds.2015-9786

CONSULTANTS CORNER

Don't Let Your Management Sabotage DMI

BY RICK GRANT
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How do you get cows to maximize their dry matter intake? Prepare a great meal and create a positive dining experience.

The dining environment that you set for the cows can either accommodate or restrict cows' natural feeding behavior. In fact, research has shown that non-dietary factors account for up to 56 percent of the variation in milk yield when cows of similar genetics are fed the same TMR (Bach et al 2008).

What that means is, once you take nutrition and genetics out of the picture, then the measured variation in milk yield among farms is tied to variation in management factors. The four biggest management factors that explained variation in milk yield among the 47 herds in the study were age at first calving; feed push-ups, feeding for refusal, and stall stocking density. In the study, milk production ranged from 45 to 74 lbs/cow/day. Stocking density alone accounted for about one-third of the variation in milk yield. Feeding for refusal added almost 4 lbs/cow/day more milk and herds that practiced routine push-ups gained another 8 lbs/cow/day more milk.

We know that cows prefer to eat together at dusk and dawn, and that they compete for feed. We also know that lying time has priority over eating time for cows. So if you have a situation where access to feed and stalls is restricted – empty bunk, lack of bunk space, not enough stalls – cows will seek to make up for lost resting time first. They do so even at the expense of eating time.

We also know that resting and ruminating enhance feed intake (Schirmann et all 2012). And that rumination and dry matter intake are positively correlated. So as managers we should never put the cow in a position where she has to choose between resting and eating. In situations of chronic rest deprivation, such as overstocking of stalls, research has shown that for every 3.5 minutes of lost resting time, cows sacrifice 1 minute of eating time.

Some of the management strategies used on farm to spur cows to eat can actually be detrimental. For example, feeding cows at night disrupts normal circadian rhythms in feeding behavior which results in decreased resting and rumination time.

In order to achieve healthy, high performance cows, we must not interfere with the biological relationship between resting and eating. That means creating a dining environment that builds on cows' natural feeding behaviors.

At the Miner Institute our lactating herd averages about 12 hours/day lying time and about 5 hours/day eating time at the bunk. That's about what you would expect for Holsteins in a well-managed free-stall barn. The high pen averages 65 lbs of dry matter per day and produces about 120 lbs of 4.1% fat and 3.2% protein milk per day.

Here is what we recommend to set the perfect dining experience for your cows:

- Manage the cows to enhance rest and rumination.
- Have feed available on demand.
- Deliver consistent feed quality/quantity along the bunk.
- Provide $\geq$ 24/inches of bunk space per cow with bunk stocking density $\leq$ 100%.
- Feed TMR 2X/day.
- Focus feed push-ups to the first 2 hours post feeding.
- Aim for about 3% feed refusal.
- Minimize bunk empty time. No more than 3 hours a day, ideally never.

FROM THE MATERNITY PEN

Cooling Dry Cows Yields More Productive Heifers

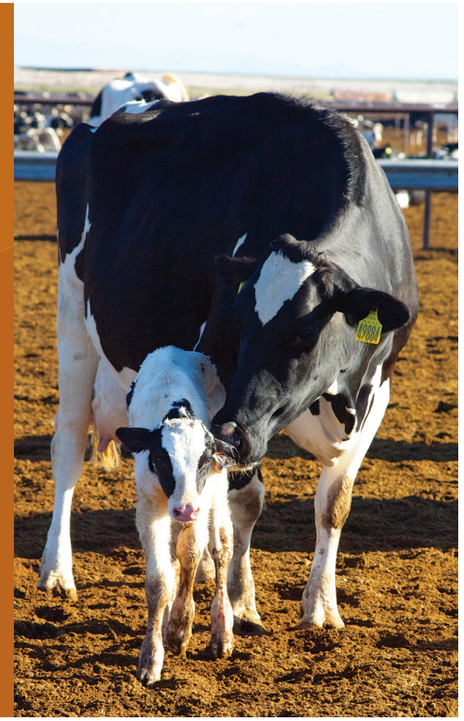
If you haven't started cooling dry cows you are missing out on a big opportunity to improve heifer productivity. That's right, not only does cooling dry cows improve the cows' milk production and reproductive performance in their next lactation it also makes a big difference in calf performance.

Research conducted at the University of Florida shows that "a relatively brief period of heat stress in late gestation dramatically alters the health, growth, and performance of dairy calves," says Geoffrey Dahl, professor of animal sciences, University of Florida. Effectively managing heat stress in dry cows can help you raise more productive heifers from the moment they arrive.

Two recent studies in Florida compared the performance of calves born from cows cooled during the dry period, typically about 45 days, to calves born from cows that were not cooled during the dry period. Results are summarized below:

- Calves born from cooled cows ate more calf starter during their first 56 days of life. Average daily intake was 1.17 lbs vs 0.75 lbs for calves that were heat-stressed in utero.
- At 56 days of age calves born to cooled cows weighed more, 158 lbs vs 135 lbs for their heat-stressed counterparts. They were also taller than their heat-stressed counterparts.
- At 12 months of age calves born to cooled cows continued their advantage in height and weight over calves that were heat-stressed in utero.
- Calves born to cows that were heat stressed during the dry period have a permanent shift in metabolism that may lead to greater peripheral accumulation of energy and less lean growth compared to their cooled counterparts.
- Heifers born to cooled cows required fewer services for conception, and become pregnant at an earlier age than counterparts who were heat stressed in utero.
- Heifers born to cooled cows produced more milk during the first 35 weeks of lactation than heifers that were heat-stressed in utero. The extra 11 lbs of milk per day adds up to an additional 2,695 pounds of milk in their first lactation.

Cooling dry cows is no longer just about the performance of the cow in the next lactation. It is about the health, growth and productivity of their offspring. Now is the time to decide how you will implement cooling for dry cows this year. Doing so will help you raise more productive heifers.



HAPPENINGS: SOYPLUS® EXPANSION ON TRACK

The skyline in Ralston, Iowa is changing as a major expansion to our SoyPlus® manufacturing plant is underway. Construction is progressing on schedule and completion of the expansion is expected for Fall 2016.

The quality and consistency that have made SoyPlus such a sought-after product will remain the top priority as the cooperative's Dairy Nutrition Plus™ product line enhances capacity. Product consistency is upheld by stringent production and quality control measures. To stay ahead of customer expectations and industry regulations, the company plans to expand its current ISO and hazard analysis critical control point (HACCP) certifications upon construction completion.

This $27 million investment will include an additional line of mechanical presses, soybean storage, soybean oil storage, finished product storage, and load-out access. The facility will increase current production by 50%, allowing the company to process more than 20 million bushels of soybeans annually.

Since breaking ground in early June, a majority of the footings have been poured and the meal bin and processing tower exteriors have been erected – the two structures are visible from Highway 30. Construction crews, led by Ames-based general contractor, Todd & Sargent, are working through the winter to enclose the process building, which will house the presser and dryer rooms.

Fitted with all new equipment, including a 70-foot rotary dryer, the new plant will be capable of operating independently of the existing structure, allowing the company more flexibility and the ability to keep one plant on line should the other undergo any necessary maintenance.

The current plant has been operating at capacity for over a year as demand for SoyPlus, an industry-leading high bypass protein dairy feed, continues to grow. Last year, the plant produced a record 375,000 tons of meal, a roughly 29 percent increase in tonnage from 2013. Sales have continually increased over the last five years.

"West Central offers farmer-owners one of the strongest bids in a 40 mile radius because we have demand for soybeans 24 hours a day, 7 days a week, 365 days a year," explained West Central's Mark Cullen, executive vice president of animal nutrition. "This expansion adds demand for 6 million more bushels annually. We look forward to working with area soybean growers to supply this plant when it comes online."

"A lot of exciting, significant changes are happening already, and many of them have been behind the scenes," added Cullen. The project has created 11 full-time job openings, and many new employees have already been brought on-board for training in part-time positions as the team prepares for operations in the fall.

The new plant along with existing capacity will be able to produce enough tons to load 18 rail cars daily. The company has board approval to add 200 new rail cars to its leased fleet.

Looking forward, the sales are forecast to warrant the investment. Customers are already contacting the cooperative's five national and international sales managers to secure new tonnage.

"The demand for new tonnage is huge, and our customer base has already indicated an immediate need for more product," said Western Regional Sales Manager, Johnny Ware.