



The Point



New findings on reproduction in high producing herds

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The Midwest has some of the highest producing herds in the country. With high production comes more challenges with reproduction. Recently I attended the Western Dairy Management Conference in Reno, Nevada and had the opportunity to learn about several new studies regarding how nutritional factors and high production affect reproduction.

The studies included data on four areas that affect reproduction: bunk space, body condition score, duration of estrus and double ovulation rate. Following are the highlights of the information presented by Dr. Milo Wiltbank from the University of Wisconsin-Madison.

Bunk Space

One of the top factors associated with reproductive efficiency is the amount of bunk space per cow in the breeding pen. The predicted

percentage of cows that will be pregnant by 150 days tends to increase at the same rate as the bunk space increased from 30-60 cm (from 35 to 70 percent). Cows that are overcrowded (less than 36 cm of bunk space/cow) have a much lower percentage of being pregnant by 150 days than cows that were not overcrowded.

Body Condition Score (BCS)

There has been substantial evidence linking body condition score to reproductive performance in dairy cows. It has also been reported that even though the change in body condition score between one month and four months postpartum has a high genetic correlation with fertility, the average or absolute body condition score for a single cow has an even stronger relationship with fertility.

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PCDART update offers ultimate "to-do" list

Version 7.93 upgrade to PCDART was released May 2007, and offers many great features including a new protocol/chore system. The much awaited protocol feature allows the creation of the ultimate "to-do" list(s) for your dairy.

The protocol features allows users of PCDART to reduce variability within their management system. These reports are designed for a different purpose, provide lists of eligible to enroll and enrolled animals complete with dates and chores to be performed on selected protocols. For instance users can create protocols in PCDART for shot administration for synchronization programs, actions to be taken after a cow calves, or when mastitis is noticed. The auto enroll/terminate feature lets you automatically enroll animals into designated protocols or automatically remove them based on events. With auto enroll/terminate you set-up the parameters for a specific action and PCDART automatically enrolls the animal on the "to-do" list for that chore.

Another great feature is that protocols can be imported from and exported to your veterinarian, consultant, etc. to assist with herd health evaluation. Additionally, this upgrade allows RFID to be used as the sole source of identification. RFID information can be entered three ways including wand the RFID tag into PocketDairy, tapping it into PocketDairy or entering it direct into PCDART.

For more information on PCDART and the most recent upgrade visit www.drms.org or contact NorthStar DHI Services at 1.800.631.3510. ★

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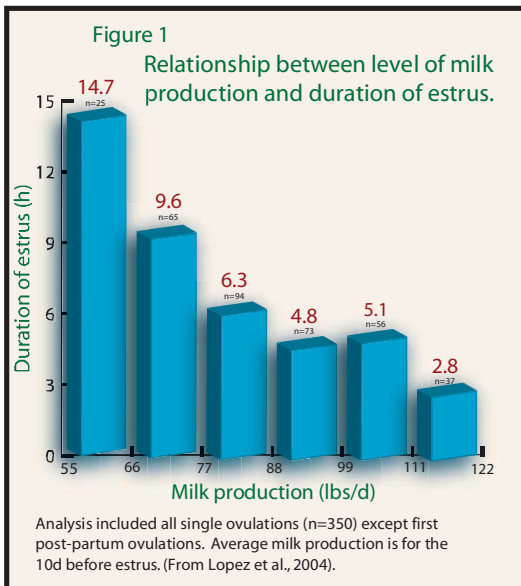
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Results of a recent study show cows that score 2.5 or less from 30-180 days in milk (BCS fault) have a much greater chance of reproductive failure by 150 days in milk. This decreased linearly as the percentage of body condition faults increased. Furthermore, the more cows below this threshold the higher the risk for poor herd reproductive performance.

Poor performance occurs due to a negative energy balance. This, in turn, causes a delay to the time of first ovulation and increases the number of cows that are anovular (not ovulating). Body condition is not tied directly to milk production as the following factors are.

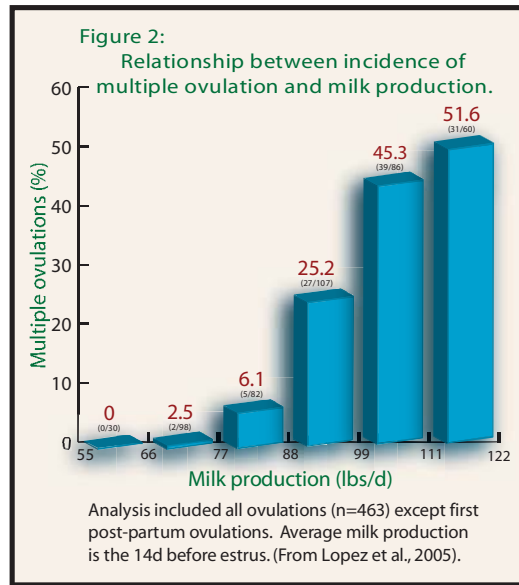
Duration of Estrus

It's clear that low rates of heat detection are reducing reproductive efficiency on commercial dairy farms. Studies have shown there is a strong negative relationship between the level of milk production and the duration of estrus. It has been theorized that high milk production tends to decrease circulating levels of estradiol concentrations producing decreased duration of estrus. Figure 1 illustrates this relationship.



Double Ovulation Rate

Another reproductive trait that has been linked to high milk production is double ovulation rate. This would be the underlying cause of increased twinning rate. It is also clear the effect of milk production is most related to the milk production within the two weeks before the cow ovulates, and not the total milk production during the entire lactation. Figure 2 shows this relationship.



are extreme for dairy character being much more likely to lose excessive weight. Keep excess dairy character to a minimum with a balanced breeding program.

Good transition programs are a must to prevent excessive weight loss. Metabolic problems at calving, lack of bunk space and over-conditioned cows are key examples of things that keep cows from adequate dry matter intakes.

Be sure to keep the ration energy dense enough so cows put on adequate weight in late lactation. The dry period is a very ineffective time to try and accomplish that task.

✓ Decreased duration of estrus

- there is no easy way around this. If a cow is producing about 70 lbs of milk per day, a four time a day heat detection program will detect about 90 percent of the cows that are in estrus. However, this same program (4x/day) will only detect about 50 percent of the cows if they are producing 100 lbs per day. The only way to combat this is increased periods of heat detection or a timed A.I. program such as Ovsynch.

Anovular cows, particularly those cows with body condition scores of 2.5 or less, need to be quickly assigned to a hormonal program (and possibly a nutritional program). An Ovsynch program is not the ideal treatment for these cows. Work with your veterinarian to design treatments with CIDR's or pretreatment with GnRH.

✓ **Double ovulation rates** – practically speaking there is little you can do about the increased incidence of

Practical Reproductive Management Implications

While it's true there are no "quick fixes" for the above mentioned problems there are some management changes that can be implemented that offer practical results.

✓ **Bunk space** – make sure the cows are not overcrowded.

✓ **Body Condition** can be a result of many factors. Genetics contributes to body condition with cows that

References

Lopez H, Caraviello DZ, Satter LD, Fricke PM, Wiltbank MC. Relationship between level of milk and production and multiple ovulations in lactating dairy cows. J Dairy Sci 2005;88:2783-2793
 Lopez H, Satter LD, Wiltbank MC. Relationship between level of milk production and estrous behavior of lactating dairy cows. Anim Reprod Sci 2004;81:209-223
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twins in regards to high production. The main increase seems to occur after 90 lbs of milk per day. Therefore, you should align your management practices to accommodate those cows. First, establish a program to diagnose twins. Since twinning cows will calve 10-14 days earlier on average you must have management strategies in place which allow for an earlier dry period and a higher probability of problems.

High production and good reproduction efficiency is achievable. If you would like assistance with your herd's reproductive success contact your NorthStar representative so they can put you in touch with a reproductive specialist and have them run your herd through the Select RePRO Analysis. ★



A NorthStar Reproductive Solutions Specialist can help evaluate the effectiveness of your current reproduction program and design a customized reproductive program that's right for your needs.

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- Professional technician service
- Estrus-synchronization
- Heat detection training
- English and Hispanic training materials
- Professional A.I. training
- Heat detection aids
- Nutritional supplements

Milk pregnancy test among current research

Todd Byrem, Ph.D., Director, AntelBio



Pregnancy detection represents the “Holy Grail” of the DHI milk testing world. With the aide of a student intern from MSU’s College of Veterinary Medicine Food Systems Fellowship Program, AntelBio has amassed a collection of matched serum and milk samples from 700 cows in various reproductive stages. The next step is to begin sample analysis to answer several key questions such as accuracy, effectiveness, costing and potential carryover contamination in the DHI system. This project will help develop a program that will allow producers to utilize DHI to aide in monitoring pregnancy, potentially offering a convenient, hands-

off mechanism to better predict calving dates and optimize dry-off times.

In addition to the research on pregnancy detection, AntelBio continues to work on new tests for Johne’s disease, which dominates news in the dairy industry around the globe. Answering the call by the U.S. Animal Health Association for the development of food-based detection systems for *M. paratuberculosis*, AntelBio is knee deep in bulk tank samples from the USDA’s NAHMS 2007 Dairy Study. Through participation in this study, AntelBio can gain recognition for the Milk PCR assay as a sensitive screening tool to detect Johne’s-causing organism in fluid milk. Since Johne’s eradication programs often take years to implement, it is likely that bulk tank or tanker testing will be readily accepted to help assure milk quality.

Another area of major interest to AntelBio is multiplex assays. Multiplex is simply the analysis of multiple components in a single test, and although DHI has been multiplexing for years, the concept is rather new to the animal diagnostic industry. In the lab, AntelBio has been growing organisms of all kinds to obtain biological reagents that will enable us to combine several disease tests into a single assay. This summer’s preliminary work will serve as the foundation for a grant proposal to acquire funding for development of a multiplex system capable of detecting numerous components in a single assay. The implications of multiplex assays are remarkable, more information at a lower cost; ultimately it could be like an extensive physiological examination in every test.

Ongoing research is key to developing new opportunities. AntelBio is committed to providing you the best possible diagnostic tools and our current projects keep us on the cutting edge of this rapidly evolving industry. ★