Technical Services Global Newsletter

December 2005

Technical Services Mission:

To support ABS Global products, people, and services in a manner that provides direct income for shareholders while maximizing customer profits

Want to contribute next month?

Contact Angela Storch (astorch@absglobal.com).

In This Issue:

Monthly TS Highlight

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Greetings from the ABS home office in DeForest! I have been with ABS since 1987 when I came on board as a file clerk in the Central Records department. From there I moved into the Finance area and then into the Animal Products area as a Secretary. Through the years my role has evolved into its current title of Udder Care Logistic Specialist.

As the Udder Care Logistic Specialist my duties include maintaining the teat dip inventories in our major ABS warehouses, processing the purchase orders for all teat dip shipments from Ecolab, working with and supporting the field on dip issues and assisting the Technical Service staff.

In my spare time, my husband and I enjoy spending time with our 2 sons, extended family & friends and cheering on my favorite NASCAR driver, Matt Kenseth.

Hope you enjoy your 2005 winter newsletter. Best wishes for a safe and happy holiday season!

2005 Western Dairy Management Conference Session – Mastitis Affects Reproduction Highlight

By: Amin Ahmadzadeh, PhD et al
(Adapted by Angela Storch, MS)

Over 80 producers, dairy industry consultants, and ABS and Balchem personnel joined the ABS Global Technical Service Team and Balchem Corporation for a pre-conference symposium in conjunction with the 2005 Western Dairy Management Conference. The purpose of the symposium was to increase awareness and knowledge on factors affecting dairy reproduction and highlight the value of improved pregnancy production and dairy profitability.

This newsletter will highlight Dr. Amin Ahmadzadeh's (University of Idaho) presentation on how mastitis affects reproductive performance. Look for further WDMC symposium coverage in the upcoming newsletters.

The research team of Ahmadzadeh et al investigated the effect of clinical mastitis and its interaction with other diseases on reproductive performance of lactating Holstein cattle. Data from 963 cows were collected from cows that calved between June 2001 and October 2003.

Retrospectively, cows were divided into four groups: cows with clinical mastitis with other diseases **(group 1)**, cows with clinical mastitis only **(group 2)**, cows with diseases other than mastitis **(group 3)**, and healthy cows **(group 4)**. Results are depicted in Figure 1. Services per conception, and days open were significantly higher ($P < 0.05$) for cows with mastitis only, and for cows with both mastitis and other diseases. The rate by which animals became pregnant over time was significantly lower for groups 1, 2, and 3 compared to group 4. Moreover, the proportion of cows that remained open by 220 DIM was higher ($P < 0.05$) in groups 1, 2 compared to group 4. However, days to first service were not different among groups, which was most likely due to intense programmed breeding. Results suggest reproductive efficiency was decreased by the presence of clinical mastitis in that a greater proportion of cows with mastitis remained non-pregnant over time. Furthermore, the negative effects on reproduction were exacerbated when cows experienced both clinical mastitis and other diseases.

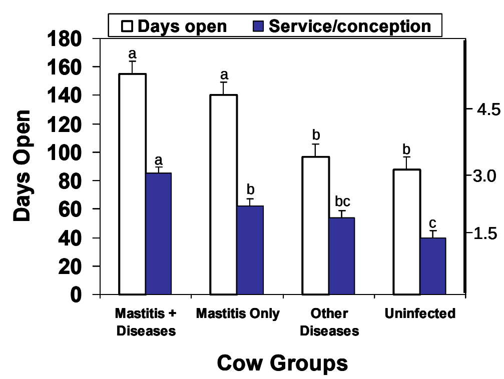

Figure 1. Effect of mastitis and other disease on days open and service per conception in Holstein cows.
[a,b,c] **Bars with different letters differ ($P \leq 0.05$).**

How does mastitis affect reproduction?

How mastitis negatively influences reproductive performance is not completely understood. This segment briefly describes the possible mechanism(s) by which mastitis affects reproduction.

Research has suggested increased $PGF_{2\alpha}$ in the infected cows may cause premature luteal regression and (or) may have detrimental effects on embryonic development and quality, causing increased embryonic loss, and consequently, increased services per conception and days open. It has been suggested cytokines (present in milk harvested from infected glands) could block follicle stimulating hormone (FSH) action and the pulsatile secretion of luteinizing hormone (LH). Both LH and FSH are important for follicular growth and maturation, ovulation, and progesterone synthesis. Therefore, mastitis could influence reproductive function by altering LH and FSH activity and (or) function, thus affecting preovulatory follicular development and (or) oocyte maturation.

Summary

The above factors may interact and collectively increase days to first service, days open, services per conception, culling rate, and decrease overall pregnancy rate. Indeed, a decrease in reproductive efficiency has a detrimental effect on the profitability of dairies. Although it has been well known mastitis causes economic losses due to reduced milk production, increased involuntary culling rate, and discarded milk, it is also apparent the effects of mastitis go beyond losses in milk production, and ultimately reduce reproductive efficiency. Hence, producers should pay extra attention to mastitis prevention and control, not only from the point of view of production efficiency, but also reproductive efficiency. Based on the study results it appears clinical mastitis alone affects reproductive performance and these effects are more evident when cows experience both mastitis and diseases other than mastitis. Moreover, while producers should manage mastitis at all times, extra attention should be taken when clinical mastitis occurs during the AI period and pregnancy establishment. Finally clinical mastitis that occurred before the first insemination (60 days postpartum) increased days open and services per conception, but did not affect days to first service indicating perhaps early postpartum mastitis did not affect cow response to systematic estrous synchronization.

(Study references available upon request)

Chlorine Dioxide Affects Teat Condition

By: ABS Technical Service Team

It's been clear for years: the chlorine dioxide class of teat dips effectively prevent mastitis. Numerous studies following NMC protocols prove it. Satisfied customers around the globe applaud it. And somewhere along the way, while these dips were working hard to protect cows from mastitis, a welcome upshot became apparent: bad teat ends improved with chlorine dioxide usage.

Though no formal study unveiled this discovery, positive field reports have poured in and continue to do so. Its effect on bad teats has been so predictable, even foremost milk quality consultants have taken note, recommending chlorine dioxide teat dips to help heal teats with hyperkeratosis, or rough teat ends. Their observations indicate the chlorine dioxide class of teat dips are very effective in softening keratin, allowing keratin removal with aggressive action during udder prep.

Softening is Key

The question has been posed that if chlorine dioxide (ClO2) “dissolves hyperkeratotic tissue, wouldn’t it also dissolve skin?”

Chlorine dioxide does not “dissolve” hyperkeratotic tissue. It softens it for easier removal. Lactic acid, the activator in the system, (the same activator as in all ABS udder care products (UC products)) is an alpha-hydroxy acid (AHA). The functional benefits provided by AHAs are skin softening and exfoliating.

Teat exfoliation in Progress

Exfoliation end result, healthy teat condition from ABS UC Products

What about the pH?

There are claims that low pH is bad while products with moderate pH (pH about 5 or 6) are more desirable for skin. These generalizations about pH are not accurate. It is recognized that a strong acid can be corrosive to skin; however, not all acidic products are bad for skin. Chlorine dioxide products, with pH levels ranging from 2.7 to 3.2, are proof. Lab testing of these products shows improved skin hydration. Field experience echoes the lab results. Furthermore, one can design a pH 5 iodine teat dip that can be very harsh to skin. Therefore, it is difficult to make broad cause-and-effect generalizations on pH.

“We have measured the skin surface pH of cows’ teats and they are essentially neutral,” says Dr. Joseph Morelli, Ecolab Senior Scientist. “This has been examined by researchers in Germany. Prolonged application of a ClO2 teat dip vs. a nil treatment control had no significant impact on the skin pH. What does this tell us? There is no basis, physiological or otherwise, to say one pH is better than another. In addition, use of a low pH formula does not significantly alter the skin’s inherent pH.”

Summary

As you consider your teat dip selection, remember:

1. Chlorine dioxide softens hyperkeratotic tissue for easier removal.

2. Chlorine dioxide pH level does not alter the skin’s inherent pH.

To learn more about chlorine dioxide technology and ABS UC products, visit the ABS website:

http://www.absglobal.com/udder_care/promo/index.html

(References available upon request)

Reduced Dry Periods and Varying Prepartum Diets Alter Postpartum Ovulation and Reproductive Measures

(Abstract from Gümen, A. et al (2005) J. Dairy Sci. 88:2401–2411)

There has been substantial recent interest in shortening dry periods; however, the effects of this management change on reproduction have not been adequately evaluated. Holstein cows (n = 58) were assigned in a randomized block design to 1 of 3 treatments: 1) traditional (T) dry period (~56 d) in which cows were fed a low energy diet from 56 to 29 d prepartum followed by a moderate energy diet for 28 d; 2) shortened (S) dry period (~28 d) in which cows were fed continuously a high energy diet; or 3) no planned (N) dry period in which cows were fed continuously a high energy diet. All cows received a high energy lactation diet after calving. Ovaries were evaluated by ultrasound and blood samples collected 3 times weekly beginning at d 6 or 7 postpartum until 7 d after second ovulation. Average days from calving until first detection of a 10-mm follicle were fewer in N (8.0 d) and S (8.9 d) than in T (10.5 d) cows. Time from calving to first ovulation was earlier in N (13.2 d) than in S (23.8 d) and T (31.9 d) cows. A greater percentage of follicles of the first follicular wave ovulated in N (89%; 16/18) than in T (42%; 8/19), with S (62%; 13/21) cows being intermediate. Double ovulation rate at the first ovulation was greater in T (61%) than N (16%), with S (35%) intermediate. No difference was detected in double ovulation rate at second ovulation (13/56). Number of cows with persistent corpus luteum (>30 d; 15/56) was not different among groups; however, short luteal phases were greater in N (28%; 5/18) than S (0%; 0/20) cows. Days to first artificial insemination were fewer in N (69.4 d) and S (68.0 d) than in T (75.0 d). First-service conception rate was greater in N (55%; 11/20) than in T (20%; 4/20), with S (26%; 6/23) cows being intermediate. Days open in pregnant cows were fewer in N (93.8 d) than in T (145.4 d), with S (121.2 d) cows being intermediate. ***Thus, shortening or eliminating the dry period leads to earlier postpartum ovulation and the results highlight the need for future large field studies to accurately evaluate the effect of dry period length on reproductive performance of lactating dairy cows.***

The Voluntary Waiting Period in Our Industry Today

By: David Prentice, DVM, MS

Dairies through-out the United States have adopted many different strategies to getting cows inseminated the first time. Timed AI programs like the ovsynch protocol have allowed producers additional options for getting cows inseminated in a timely fashion and producers are using these programs to actually form their voluntary waiting period (VWP). A question often asked is "should we change our voluntary waiting period by adapting a timed AI protocol and make all first services occur to said program?"

A good starting place for this discussion is to first define what a voluntary waiting period is. In the strictest sense, it is the interval of time from when the cow calves until she is eligible to be bred the first time. As the name implies, it is a period established by the producer voluntarily, and traditionally ranges between 40 and 70 days. Figure 1 shows the cumulative frequencies of voluntary waiting periods (VWP) for two years, 1995 and 1998 from herds using Dairy Records Management Systems (DRMS). Few producers choose a VWP less than 40 days (less than 20% in both 1995 and 1998) and this is because they know the cow needs time to recover from calving. The uterus needs to undergo involution and initiation of ovarian activity needs to happen.

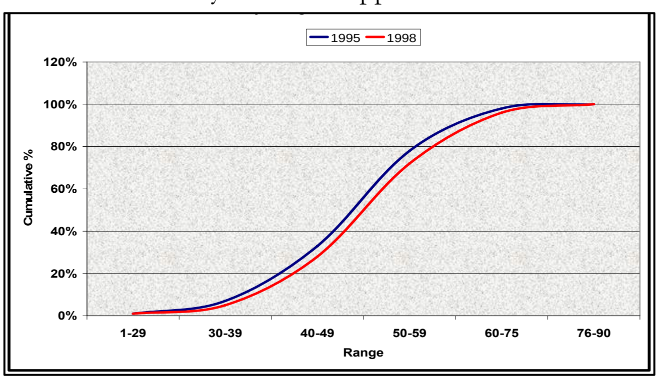

Figure 1. Cumulative distribution of voluntary waiting periods for 3377 herds using DRMS in 1998 and 1995.Data adapted from Miller et.al., Journal of Dairy Science 2005

So why might a dairy not conform to its defined VWP? A common reason is producers may believe earlier heats are more fertile because the eggs released then were formed during a less stressful time (prior to calving). This reason might be construed as fear – breed her now or else!

One thing timed AI programs have done is to tighten up breeding around the VWP and thus allowing for better adherence to the defined VWP. A "front-end loaded" timed AI program is where 1st breedings occur within 7 days from the VWP (Example: time A.I. all animals first at 70 day VWP). The presynch ovsynch program is frequently recommended (2 shots prostaglandin 14 days apart prior to ovsynch) to improve response at first A.I. Another approach is "back end-loaded" timed A.I. program where timed A.I. is combined with heat detection so all animals receive their 1st breeding within a specific time frame (Example: 40 d VWP with 1st breeding on heat during/after presynch and time A.I. remaining animals with ovsynch by 70 days).

Reproduction on modern dairies is a challenge and no one VWP or approach to breeding is correct for every single herd. Some herds will have a 40 day VWP and have excellent reproductive performance using very little timed AI, other herds will have poor performance if they do this and should rely more on timed AI programs. Making broad generalizations in regards to all herds in relation to their reproductive programs should not be done. Each herd should be evaluated on an individual basis. Prior to switching to a 100% front end loaded program, the producer should consider how this will affect labor, cow movements, time constraints, added costs etc. Additionally, each herd should be evaluated frequently because what is working today may not be the right thing for that herd tomorrow. Work with your veterinarian and consultants to monitor the performance so you are sure you are getting economic benefit of whatever program your dairy implements.

Poor Teat Condition Increases Risk of Mastitis

By: Kylene Anderson

Research has shown poor teat condition negatively impacts milk quality and udder health. Thick, rough, calloused teat ends are associated with an increased risk of clinical mastitis. Dry, cracked teat skin allows for the harboring of higher bacteria levels (especially Staph. aureus) and makes teats more difficult to clean.

Evaluation of teat-end callosity in commercial herds may help identify or resolve problems related to milking management, environment or the milking machine function. Teat ends are classified as normal if teat ends are smooth, soft and the skin is healthy. Teats are considered abnormal when teats are chapped, cracked, red, or have open lesions. Teat evaluation should be done prior to milking.

To learn more about teat end and skin condition scoring, access the complete Techline titled "Poor Teat End Condition Increases the Risk of Mastitis" at:

http://www.absglobal.com/tech_serv/resources/resourcefiles/dairy/TeatConditionTechline05.pdf