

## REPRODUCTIVE HERD HEALTH PROGRAM IN LARGE DAIRY HERDS

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To the high producing dairy cow reproduction is a luxury. Milk production and general health maintenance are often maintained at the expense of reproductive events such as conception and pregnancy maintenance. Unfortunately, these events are a luxury the dairyman cannot live without.

Due to the interaction between environmental factors and intensive herd management these reproductive events are further compromised, prolonging the herd's calving interval. A long calving interval results in decreased milk revenues due to lower milk production over a long period of time. Without an optimal calving interval it becomes difficult for a dairy to operate efficiently, without financial constraints. The objective therefore, of a reproductive herd health program is to establish a calving interval that maximizes the production potential of the herd.

The role of the veterinarian is one of program designer, instructor and performance evaluator. The dairyman must be willing to compensate the veterinarian for management services and to cooperate with him or her in the implementation of the program. In addition, both producer and veterinarian must establish a set of reproductive goals and together evaluate the progress being made in achieving them.

To execute the program effectively, scheduled visits to the dairy are made. With the average herd size in Florida exceeding 600 cows, weekly visits are recommended.

### Dry Cow Management

Reproductive efficiency begins with the dry cow. Certain metabolic, hormonal and nutritional events take place during this time that have an effect on the subsequent lactation.

Cows with health problems, lameness, pendulous udders and chronic mastitis should be culled prior to drying. There is some evidence that cows with chronic mastitis may have decreased conception rates. Cows should be reconfirmed for pregnancy prior to drying, in order to avoid feeding open cows. The ideal dry period should be 40 to 60 days, variations from this may be detrimental to the next lactation. Dry cows can be vaccinated for the control of calf diarrhea and other diseases, when indicated by local conditions. Vitamin E and Selenium injections at this time has helped reduce the incidence of retained placenta.

Proper nutrition is essential during the dry period. High energy and calcium intake should be curtailed, in order to prevent metabolic

disorders such as milk fever. It is the absolute calcium intake that is important and not the calcium to phosphorus ratio. Calcium levels should be fed below maintenance requirements. Incidence of milk fever in the herd should not exceed 5%. Older cows and high producing cows are at higher risk. Feeding high protein early in the dry period, lower phosphorus than calcium and lead feeding (3 to 8 lbs.) of the lactating cow ration late in the dry period, prevents milk fever.

Milk fever increases the risk for difficult calvings, retained placenta, mastitis and uterine prolapse. In addition, fresh cows with lower calcium blood levels without signs of milk fever, had a higher risk for retained placenta and uterine prolapse. All of these conditions mentioned above have a negative effect on reproduction.

Dry cows should be dried in the proper body condition. If cows are thin, they should be fed to gain weight late in lactation and not during the dry period. Fat cows are predisposed to milk fever and other related disorders when they become fresh. Thin cows have an increase in the number of days to first service thus, a prolonged calving interval.

Dry cows must be provided with shade in order to protect them from hot weather. Cows with shade in the dry period produce more milk and have improved fertility than non shaded cows.

#### Fresh Cow Management

Close up dry cows are observed daily for signs of labor. They should calve in a clean, well bedded box stall or a clean maternity pen that is not crowded. During labor the cow is susceptible to bacteria contamination from the environment; this can cause retained placenta and uterine infections, both are detrimental to fertility. Strict sanitary rules and procedures cannot be compromised during this time. A trained individual should supervise parturient cows in order to assist them if necessary and to treat milk fever cases.

Calving dates and complications should be recorded on the health card of the individual cow or entered in the computer. Also, the cow can be marked by a coding system. An example includes, MF (milk fever), RP (retained placenta), OB (difficult birth), and ABO (abortion). These cows receive special attention in early lactation by trained individuals.

Cows with assisted delivery must be monitored closely for the next few days. Soon after calving they are given two 5 cc injections of oxytocin 6 hours apart. If they develop a fever and are sick, 60 cc of penicillin are given in the muscle and evaluated at the next scheduled visit by the veterinarian. Cows that do not shed the afterbirth within 24 hours after calving are given oxytocin and also capsuled with tetracycline boluses, until the placenta is shed. If fever occurs in retained cows, penicillin is also given. All fresh cows enter a separate pen for at least ten days. Here, they can be watched for any discharge, going off feed and treated accordingly.

Rectal examinations of fresh cows detects problems such as uterine infections and cystic ovaries, early, so that they can be corrected and

not hinder reproduction. For cows with normal deliveries, the examination is done at three weeks fresh, for those cows having complications they are examined at ten days fresh. In the past, we have overemphasized uterine infusion with antibiotics. This is not only costly but may hinder the natural defence and healing mechanisms of the uterus. If an odorous discharge is observed or if the uterus has not involuted completely by thirty days, infusions with penicillin or tetracycline is indicated. The ovaries are evaluated at this time, if they are cystic a treatment with GnRH is appropriate at the initial examination.

In a fresh cow program our efforts must be focused on the return of the cow to cyclicity. When a cow is in heat it promotes the uterine defence mechanisms to fight infection. In addition, the more cycles the cow has prior to her first service, the higher the conception rate. We can promote the early return to cycling by careful attention to body condition at calving, care of the fresh cow and nutrition during early lactation. Further, injection of GnRH at fifteen days fresh followed by a prostaglandin injection ten days later has helped to establish early cyclicity in cows with abnormal parturitions.

### Breeding Cow Management

Successful artificial insemination is dependant on good breeding practices and accurate heat detection. Cows or heifers should be observed twice daily for signs of heat. The traditional AM / PM (heat in the AM breed in the PM, or vice versa) rule continues to be an excellent protocol. Lockable stanchions are practical and useful for the application and observation of heat detection aids, genital exams and breeding. Heat detection aids include crayon markings on the tail heads, as well as the date of the last observed heat. Stanchion facility, design and feeding practices should ensure that 98 - 100% of the cows are locked daily. Heat detection accuracy and high conception rates are correlated with the percentage of cows locked daily.

Artificial insemination technicians should be instructed on the voluntary waiting period and actions to be taken when abnormal heats or discharges are noticed. In commercial herds voluntary waiting period should not exceed 65 days. Labor must concentrate maximizing heat detection in the first 100 days of lactation. Breeding of non heat cows is a more common cause of decreased conception rates than improper timing during heat. A once daily schedule of breeding all cows with heats observed the past 24 hours has given comparable results to twice daily breeding. Cows in heat beyond the waiting period should be inseminated unless grossly abnormal heat interval or discharges are observed. Never miss an opportunity to breed a cow!

Confirmed pregnant and chronically open cows should be grouped in pens separate from the breeding corrals to facilitate the effort to breed these cows. Cows with delayed conception over 130 days can be placed in a bull or "clean up" string.

Any heat detection aid such as crayon, should be used as an adjunct to watching for signs of heat. Excellent conception rates have been achieved by breeding cows soon after standing to be mounted. All labor

personnel involved in heat detection must make a diligent effort to watch cows for signs of heat as well as reading heat detection aids. Do not rely solely on these aids.

#### Cows Checked For Pregnancy Exam

Early pregnancy diagnosis is desirable so that non pregnant cows can be identified and rebred as early as possible. Most programs recommend diagnosis between 35 to 40 days after the last insemination. The incidence of abortion by membrane slip at this time has been reported to be less than 7%. After a cow has been diagnosed pregnant, the breeding date is ascertained and recorded on the individual record. It is recommended to calculate her drying date at this time, in order to make this procedure easier later on. All cows prior to going dry should be palpated by a veterinarian or skilled worker, to prevent open cows from going dry.

If a cow is found open at the time of pregnancy diagnosis, ovarian or uterine diseases are ruled out, or treated if present. A prostaglandin injection can be given at this time. If the cow is not seen in heat within five days, a second injection is given ten days after the first injection. The objective behind this protocol is to shorten the estrous cycle interval and rebreed the cow earlier.

#### Cows Not Seen in Heat

Failure to observe cows in heat continues to be an economically important problem in many herds. Every effort should be made to have at least one heat recorded by sixty days fresh. It has been reported that the more cycles a cow has prior to her first service, the higher the conception rate for that breeding. The single most common cause of failing to catch cows in heat is human error. Other causes include cystic ovaries, thin cows and pregnancy.

To promote cyclicity, the administration of GnRH, followed by a prostaglandin injection ten days later, at three weeks fresh has been recommended. It is also recommended to inject all cows not seen in heat by fifty days fresh with prostaglandin. Both of these maneuvers have improved fertility, particularly those cows having problems at calving such as retained placenta, milk fever and difficult calvings.

Body condition at calving has been correlated with ovarian cyclicity and signs of heat. Thin cows cycle much later and often show no heats, compared to properly conditioned cows.

#### Cows Having Irregular Estrous Cycles

An irregular cycle is defined as a cow coming in heat less than 17 days or more than 22 days from her previous heat or breeding. Included in this definition are cows that are "bulling" (riding 3 days consecutively).

Those herds having poor heat detection practices tend to have more cows with irregular heats or cows without heats. Therefore, the

veterinarian and dairyman must first evaluate the accuracy of heat detection in the herd, in order to rule out management failures.

The most common cause of irregular cycles is cystic ovaries. This condition occurs more often in older cows under stress during early lactation. The stress is relative to the degree of negative energy balance related to milk production. Cows with uterine infection are also at risk. The incidence is about 12%; a higher incidence warrants investigation into the feeding practices and overall health of the entire herd.

Cystic cows are treated with GnRH or an LH preparation as early as possible. The practice of waiting for natural recovery and treating after 40 days fresh has been reevaluated. The administration of GnRH at 15 days fresh has reduced the incidence of cystic ovaries and improved conception in some herds. However, this approach to all fresh cows may not be cost effective.

#### Cows Treated on the Previous Visit

Therapeutic regimens and diagnostic procedure are not always accurate or effective. Reexamination of previously treated cows, is recommended to confirm that the cow is ready for breeding. The record keeping method in the herd must offer the opportunity to sort these cows out and present them for reexamination at the next scheduled visit.

#### Body Condition Score

The amount of fat covering over the loin and groin areas are an indicator of the amount of stored energy for individual cows. This energy is mobilized and used during early lactation, when dry matter intake is reduced and lags behind milk production, in order to meet energy needs.

Adequate body reserves are needed for health maintenance, optimal milk production, ovarian function, and pregnancy maintenance. Thin cows have reduced fertility and over-conditioned cows are predisposed to clinical conditions that have a negative effect on production and fertility.

When evaluating body condition on dairy cows, a numerical score from 1 to 5 is assigned. The score is based on the amount of fat present in the loin and groin areas. The best time to score cows is at calving, early lactation and at drying.

Cows should go dry at a score of 4 and not drop below 3 during the first 100 days of lactation. The feeding practices of the herd must allow cows to gain weight during the latter part of lactation. The reader is referred to the section in these proceedings by Dr. Bill Chalupa.

#### Evaluation of Herd Reproductive Performance

By examining reproductive parameters provided by DHIA associations or on farm computers, dairymen can evaluate the level of reproductive efficiency in their herds. DHIA record systems are widely used and are

popular among dairymen nationwide. On farm computers are gaining in popularity as software programs become more versatile. A prerequisite to either program is accurate and complete record keeping on all reproductive events occurring in individual cows.

When evaluating these parameters, the following concepts are important, 1) performance goals, and 2) management intervention figures. Performance goals should be economically justified and must be attainable. They provide an economic incentive, since their attainment increases revenues. The figure which dictates management intervention, provides a safety net to prevent further deterioration in the herd's reproductive performance. This intervention must reevaluate the present reproductive program, through the assistance of a nutritionist and veterinarian.

Reproductive Parameters	Goal	Intervene
Calving interval	13 Mo.	14 Mo.
Average days open	115	125
Conception rate		
first service	45%	32%
second and third service	80%	65%
% of herd open > 150 days	5%	10%
Days in milk	< 155	> 175
Herd Repro. Summary (hrs)	> 65	< 52
Service/conception	2.0	2.6
<b>Heat Detection Efficiency</b>		
<b>Heat intervals</b>		
< 18 das.	< 10	20
19 to 24 das.	60	35
38 to 46 das.	20	30
> 46 das.	10	15
24-day heat trial percentage	90	70
Cows bred by 90 days	80%	70%
Palpation preg. rate (% pregnant presented for preg. check)	85%	70%
Preg. cows presented for AI	< 5%	> 8%
Detection of heat after 60 days fresh	> 85%	< 70%

### Conclusion

To achieve excellent reproductive efficiency, large dairy herds must focus on the organization and training of workers, grouping cows for intensive reproductive management and on procedures to evaluate reproductive performance. This performance is dependent on the interrelationship between management, environmental and cow factors. Of these, management or human invention, is the most limiting one.