Replacement heifers - breeding management

Edward P. Call

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Abstract

Records are the backbone of any breeding program. Artificial insemination (AI) is essential to maximizing genetic gain and minimizing calving problems and breeding costs. In addition, AI allows controlled calving - calving at the dairyman's discretion - not Mother Nature's! Adequately grown heifers should be added to the breeding list during the 13th month of age and serviced to meet the herd's calving goal. Feeding and handling systems should not change during the month preceding and during the breeding period, in order to minimize stress on the reproductive system. Economic loss because of delayed calving beyond 24 months of age is about $30 per month. With an average age of first calving in Kansas DHI herds of 29 months, the annual loss to Kansas dairy producers exceeds $2 million annually.; Dairy Day, 1986, Kansas State University, Manhattan, KS, 1986;

Keywords

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REPLACEMENT HEIFERS - BREEDING MANAGEMENT

E. P. Call

Summary

Records are the backbone of any breeding program. Artificial insemination (AI) is essential to maximizing genetic gain and minimizing calving problems and breeding costs. In addition, AI allows controlled calving - calving at the dairyman's discretion - not Mother Nature's! Adequately grown heifers should be added to the breeding list during the 13th month of age and serviced to meet the herd's calving goal. Feeding and handling systems should not change during the month preceding and during the breeding period, in order to minimize stress on the reproductive system.

Economic loss because of delayed calving beyond 24 months of age is about $30 per month. With an average age of first calving in Kansas DHI herds of 29 months, the annual loss to Kansas dairy producers exceeds $2 million annually.

Introduction

Calving two-year olds at more than 24 months of age renders an economic hardship on the dairy operation. Current costs of rearing heifers to 24 months of age is near $600 in variable cost plus another $125 in fixed costs for a total investment of about $725 plus the replacement value of the heifer. The cost for delaying calving beyond 24 months is $30 per month. In the average Kansas DHI herd, first-lactation cows calve at 29 months, resulting in a loss of $150 per two-year old, which translates into a statewide loss of more than $2,000,000 per year.

Identification

Replacement heifers are often referred to as "lost souls." In fact, on many farms, replacements become lost because of inadequate identification and/or the press of the daily routine.

Breeding of replacement heifers starts with the correct breeding date and service sire for the dam and carries on to the most important day in each heifer's life - birth day. Recording calf identification, sire, dam, and date at that time will ensure maximal accuracy of this information through the life of the heifer.

The DHI program provides an optimal system for a complete and accurate identification program. The following DHI forms are a part of the recording and retrieving system for proper heifer identification:

DHIA 217 - Calving and Breeding Information (record all calving and breeding dates).

DHIA 202 - Monthly Herd Summary (summarizies heifer calves born each month and urges complete identification).

DHIA 226 - Replacement Females Inventory . . . (semi-annual review of all heifers in the herd along with age - provides guidelines for grouping heifers to breed by age).

DHIA 211 - 21 Day Repro-calendar (provides a record of heats-not-bred (HNB) and breeding dates with anticipated date of next heat).

DHIA 212 - Management Guidelines -- Heifer Option (A monthly reminder of heifers that have reached breeding age and springing heifers).

DHIA 200 - Monthly Individual Cow Report (lists heifers to calve during next month - encourages challenge feeding before due date).

Breeding Systems

Replacement heifers may be bred by artificial insemination (AI) or naturally. For progressive herds looking to the future, 100% commitment to AI is necessary for the following reasons:

1. Cost - AI service/conception is about one-half (1/2) the cost of bull maintenance.

2. Genetic gain - a young bull has about one chance in 12 (8%) of siring daughters above breed average. Bulls in the +80 percentile will sire nearly 70% of their daughters above breed average.

3. Calving ease - AI bulls are screened for calving difficulty and selection can reduce dystocia in first calf heifers.

4. Discrimination - Through AI, the dairy producer decides the right age and weight at which to breed each heifer. Bulls will indiscriminately service any heifer in heat.

AI - Which Way to Go?

Time and heat detection. The time-honored system to breed heifers with AI is to watch for heat and plan AI accordingly. Requirements for this system are:
1. Time and labor to heat check over weeks
2. Close proximity of heifers
3. Facilities for AI of heifers
4. Record system to record HNB and anticipate next cycle

This system has worked well for more than 40 years and has provided near 95% calf crop. Some 5% of all heifers fail to settle, generally from abnormalities of the reproductive system.

Synchronization and AI. Recent advances in reproductive research have provided dairy producers with the opportunity to synchronize heat periods and provide AI for groups of heifers over a much shorter time span. The main benefit of synchronization is that time and labor are reduced, but these are partially offset by drug cost.

Two synchronization schemes are available:

1. Prostaglandin $F_2\alpha$ (PGF) -Estrumate® and Lutalyse®. These compounds destroy luteal tissue (corpus luteum or CL or yellow body) in a manner similar to the natural destruction of the CL about 16-17 days after the last heat period.

2. Progestins - Synchromate B®. Progestins have a totally suppressing effect on reproduction. As long as the compound is intact (ear implant), all estrous cycles cease. Once the implant is removed, then the normal cyclic activity resumes and the heifers are in heat after 24 hr.

Both programs are effective in synchronizing a large majority of cycling heifers into heat in a short period of time. The main question becomes: Whether to time AI or heat check and AI? Both programs have schemes by which heat detection can be eliminated. However, practical experience suggests:

1. Use heat check and AI after synchronization; then
2. Time AI for those heifers not detected during the heat-check period; finally,
3. Heat check one (1) day later and re-inseminate any heifer seen in heat.

Note: Follow label directions exactly in the proper administration of the respective drug.

Management Considerations

At this point, it is assumed that growth rates have been adequate and heifers have reached the desired breeding weight during the 13th month of age. Also, heat periods-not-bred (HNB) have been recorded (as many as five). In fact, it is advised to palpate the reproductive tract per rectum of any well-grown heifer not seen in heat by 13 months to check for infantile (free-martin?) organs or utero-ovarian abnormalities. Any heifer (large breed) 13 months of age and over 700 lb should be on the breeding list. Some producers may want seasonal calving or to avoid calving during certain periods. Using the DHIA 226 (Heifer Inventory) or the Management Guidelines -- Heifers (DHIA 212), the month of service may be designated well in advance, or heifers may be grouped for synchronization during a given time period.

The reproductive process is multi-faceted and even slight alterations may lower breeding efficiency. Observe the following management guidelines:

1. Have heifers growing during the breeding period.
2. Avoid making sudden changes in feeding and handling systems within the month preceding and during the breeding period.
3. Plan on repeat heats. Conception rates vary tremendously but 60% would be optimum on first service; 80% conception during a 25-day breeding season; and 90% pregnancy rate after three (3) services.
4. Heat detection is the key to high breeding efficiency. Twice daily heat checks, especially early morning and late evening, other than times of feeding, along with DHIA 211 - 21 Day Repro-Calendar will provide maximal results. While rump patches and chalking, along with teaser (gomer) animals, may help under certain conditions, it is the "Eye of the Master" that makes the final decision - to use AI or not to use AI.
5. Even with all other factors being well managed, improper AI technique

may result in less-than-adequate (or acceptable) breeding results. Generally, heifers settle more efficiently than lactating cows. With heifer AI, an attainable goal for services/conception (S/C) would be 1.3. If S/C is greater than 1.5, then the heifer AI program should be reviewed, including the AI technique itself.
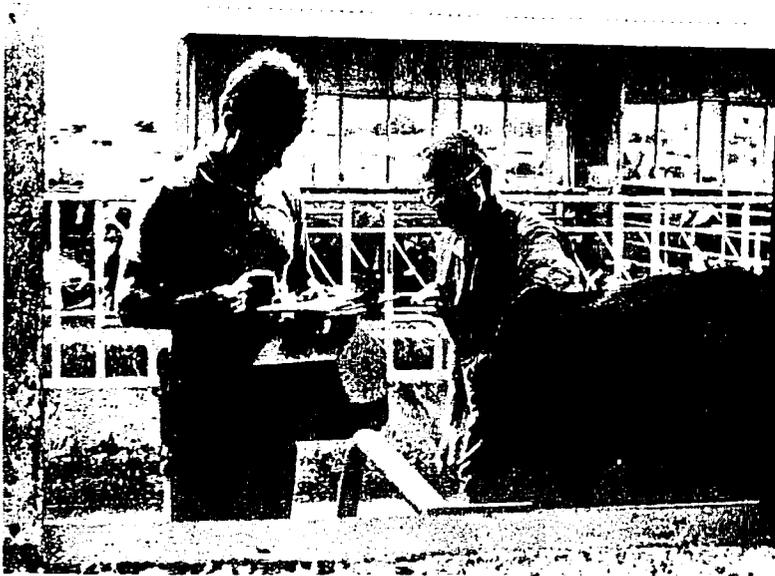
Jim Smith (herdsman) and Dr. E. P. "Ed" Call, Extension Dairy Specialist, working on a problem breeding cow

Elaine Carpenter, research assistant, performing an assay in the Endocrinology lab