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MANAGEMENT OF NATURAL SERVICE BULLS ON LARGE DAIRIES

P. J. Chenoweth¹ and J. E. Smith

Summary

Natural service (NS) bulls are widely used on large dairy farms despite the well-proven genetic progress achievable through AI. Producers may choose to use NS bulls for a variety of reasons that are discussed below. In this presentation, problems encountered with the use of NS bulls on a large dairy in Kansas are described in relation to reduced reproductive performance on that dairy. Lameness in bulls was considered to be a major contributing factor to reduced herd reproductive performance, with seminal vesiculitis also possibly playing a role. Possible contributing factors for the occurrence of these problems in the bull population are discussed. A number of recommendations are made for optimal selection, use, and management of NS bulls. These include the following. Natural service bulls should preferably be younger bulls (< 2.5 years of age) and tractable. Facilities should be adequate for the safe handling of bulls and people. Attention should be paid to minimizing heat stress during the summer. An environment should be created where reproductive behavior can be fully expressed. Appropriate considerations include: sufficient space for courtship and breeding; minimizing distractions, such as people and noise; and the provision of suitable flooring for breeding (i.e., provision of secure footing). Natural service bulls should pass a breeding soundness evaluation prior to purchase and/or first use and this should be repeated at least annually. Bulls should undergo the same herd health procedures as the cow herd (except for brucella,

trichomoniasis and MLV IBR vaccination). Particular attention should be paid to the prevention of venereal disease (vibriosis and trichomoniasis) transmission. Monitoring and record keeping for cows exposed to bulls should be similar to that for cows in AI groups and include regular pregnancy checks.

(Key Words: Bulls, Fertility, Lameness.)

Introduction

Bulls are commonly used on United States dairies; particularly on newly established large dairies. Natural service (NS) bulls may be exclusively employed initially, and then less as increasing emphasis is placed upon improving the herd's genetic base, including raising replacement heifers. With the latter consideration, a number of producers using NS bulls consider that they can purchase replacement heifers with acceptable genetics. Dairy bulls are often not subjected to close scrutiny or monitoring. As a consequence, many dairies fail to adequately exploit the potential for improved reproductive performance with NS bulls. NS bulls provide the "default" option when the effective implementation of AI is difficult or costly. Bulls are used in breeding management schemes to eliminate perceived obstacles to AI including costs and the lack of qualified personnel to perform tasks such as heat detection. A common perception is that a motivated bull will generally detect more heats than will humans, particularly if the latter are poorly trained. Bulls also should be able to deposit semen at the most advantageous time for female fertility because they

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work 24 hr per day, 7 days per week. Bulls often service receptive females a number of times during the period of female receptivity. Thus, bulls continue to be used in dairy herds because they provide an alternative to managing a heat detection or an estrus synchronization program and the appropriate personnel to manage a successful AI program. This report describes problems observed with NS bulls on a large dairy in southwest Kansas.

Procedures

Bulls were examined in January 2000 on a large, newly established, 2,500-cow dairy in southwest Kansas. This was a new facility where management procedures and personnel were still evolving as the dairy grew in size and attempted to achieve production goals. All breeding was exclusively performed by NS bulls. It was evident, however, that natural breeding was not as successful as it should be, with a large number of cows (more than 500) remaining open after more than 200 DIM.

Natural service bulls were obtained under contract by a supplier and varied in age. The bull to female ratio was approximately 1:40. Female groups consisted of several hundred cows. The cow groups included varying numbers of open and pregnant females at any given time. Bulls spent much of their time in free-stalls, on concrete, although access had recently been provided to outside dirt lots. In the free-stalls, the "working" area consisted of the concrete alley-way behind the stalls, which was periodically flushed with water. Bull groups comprised mixed ages of bulls that were generally kept intact, although they were rotated between cow groups at approximately 1-week intervals. Bulls were fed the same diets as their respective cow group. Both cows and bulls were vaccinated against leptospirosis (5-way) and vibriosis. A total of 98 bulls were subjected to a physical examination, 66 of which were electro-ejaculated for semen evaluation. Approximately 30 bulls were sampled to test for trichomonosis. An additional 20 young bulls were subjected to visual appraisal only.

Results and Discussion

During examination it was observed that many of the bulls were "tentative" in their footing on concrete. Twenty-one of the 98 bulls were classified as poor breeding prospects and were recommended to be culled. An additional 7 bulls had problems that might compromise breeding success, but which could improve with time. Screening for trichomoniasis was negative for all samples. No obvious problems were detected in the young replacement bulls that were subjected to a visual appraisal only. A summation of the problems encountered in bulls is presented in Table 1.

The most common bull problem encountered was lameness. Lameness was recommended to be culled only if the problem was severe and probably irreversible. Lameness in the hind limbs was regarded as being more detrimental to reproductive success than lameness in the fore limbs. Severely lame bull problems included a dislocated hip, a dislocated patellar (knee cap), a number of swollen joints (particularly of the lower limbs), and acute foot soreness. Little evidence of severe laminitis was evident, although it is probable that subclinical laminitis was present. With bulls being fed the same rations as lactating dairy cows, it is probable that some bull lameness problems would be caused by excessive energy and calcium in their rations. However, it was considered that a large number of the lameness problems observed in this herd were due to trauma (i.e., loss of footing or fighting with other bulls).

The relatively high prevalence of seminal vesiculitis or accessory genital disease observed (17.3%) was of concern, although only two bulls were severely affected. Active vesiculitis will adversely affect semen quality. Often the infection will spread to other parts of the genital tract where it may lead to irreversible problems. The factors leading to increased seminal vesiculitis in a group of bulls are not all known. This problem is often encountered in young beef bulls on

performance test, when there is a combination of high energy rations and intensive rearing (and perhaps increased homosexual behavior). Without further observations and tests, it would be difficult to determine the cause in this case. However, managerial options such as rotating bulls, reducing cattle density in pens, and perhaps feeding chlortetracycline should help to reduce this problem.

Conclusions

The practice of running bulls in mixed-age groups with large numbers of females in free-stalls facilities with concrete floors seems to be a major contributor to the “bull problem” encountered at this dairy. Bulls are particularly susceptible to injury during mounting and mating when they are often off-balance, with their weight being supported by the hind feet. When footing is insecure, especially in confined spaces, injuries easily occur. Bulls with injuries are less likely to mount and serve. In addition, the fear of injury will lead to loss of confidence and reduced sexual activity. In this case, running older bulls with younger bulls, particularly in confined spaces, also could contribute to lowered activity by the latter group because older bulls tend to be dominant, more aggressive, and prevent other bulls from accessing females, even if they themselves are infertile. Older bulls also pose a human safety risk as well as tending to outgrow free-stalls. In the present case, lameness also was a concern with cows at the dairy, with factors such as concrete texture and free-stall design probably playing roles.

Recommendations

The following recommendations should be followed when using bulls on commercial dairies:

- All virgin bulls should be subjected to a breeding soundness evaluation (BSE) before admittance to the herd.

- All bulls should be given a physical exam every 6 months and a full breeding soundness exam every 12 months.
- Adequate handling facilities should be provided for the working and handling of bulls to reduce the risk of injury to both animals and personnel.
- Bulls in freestall housing should be given access to dirt lots.
- All working bulls should be monitored daily.
- A workable system is to maintain bulls in breeding groups that will be rotated into the breeding herd for 1-2 weeks, followed by 1-2 weeks of rest.
- Bulls ideally should be less than 2.5 years of age. Aggressive, older and large, heavy bulls should not be sold.
- A suitable bull to female ratio is approximately 1 bull to 15-25 open cows.
- If a dairy has large pens it may be beneficial to distribute open cows over more pens to reduce the number of bulls in any given pen.
- Avoid drastic changes in diets fed to bulls. Don't put bulls abruptly onto the same diets as lactating cows without slowly increasing intake and energy in steps
- Minimize the effects of heat stress by providing shade and cooling systems.
- Bulls should be subjected to the same vaccination and preventive health program as the cows (with the exception of vaccinations for brucellosis, trichomoniasis and MLV IBR).

It is important for personnel to be especially alert for signs of lameness. Early detection of lame bulls is critical and employees should be trained to observe common lameness signs, as well as other problems associated with breeding bulls. Lame or otherwise injured bulls should be treated and/or replaced as soon as possible.

Table 1. Inventory of Diagnosed Problems of Bulls in Natural Service

Problem	% occurrence (no./98)
Lameness ¹	23 (23)
Accessory genital disease ²	17 (17)
Penile problems ³	7 (7)
Poor semen quality	4 (4)
Other	
Cryptorchid	1 (1)
Lumpy jaw	1 (1)
Eye cancer	1 (1)
Respiratory infection	3 (3)

¹Severe lameness (13 of 98).

²Seminal vesiculitis (17 of 98).

³Inflammation or injury (7 of 98).