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The Veterinary Journal 171 (2006) 70–78
The Veterinary Journal
www.elsevier.com/locate/tvjl

Review

The management of bovine reproduction in elite herds

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Accepted 27 June 2004

Abstract

The management of bovine reproduction is the cornerstone of health provision in elite herds. Aims and objectives for reproductive performance should be herd specific and data to monitor progress should not only be frequently collected, but also analysed and reported. Strategic monitoring of animals should include a vaginal examination for evidence of uterine disease, as well as transrectal ultrasonography of the genital tract. There has been considerable advancement in our ability to intervene in the reproduction of cattle during the last 50 years. However, it is salutary to note that during this time fertility has consistently declined, despite increasing veterinary intervention.

Most elite herds use artificial insemination and success depends on accurate detection of oestrus expression, but this appears to be less overt than 25 years ago. In addition, half the cattle have abnormal oestrous cycles after parturition and conception rates are decreasing by 1% per year. Risk factors for abnormal oestrous cycles include puerperal problems, negative energy balance, which can be evaluated by body condition scoring, and uterine disease. Bacterial contamination of the uterus is ubiquitous after parturition in cattle and disease disrupts ovarian follicle growth and function. Reproduction is also disrupted by stress associated with clinical disease, pain or a sub-optimal environment. The challenge for veterinarians providing reproduction control programmes to elite herds is to transfer our knowledge of the problems underlying subfertility to the farm, in order to provide effective solutions.

Keywords: Bovine reproduction; Veterinary management; Infection; Stress; Nutrition

1. Introduction

The Pareto Principle, propounded by an Italian economist in 1897, suggests that 80% of a business's profit is generated by 20% of the clients and, when applied to veterinary practice, these clients include the owners of elite cattle herds. Elite herds are not readily defined, but "*elite*" is a synonym for "*best*" and such herds would include the top 10% of milk yield or those focussed on the production of high genetic merit offspring. Irrespective of the precision of the definition, most veterinary practices can readily identify their best herds. Maintaining and growing the business with these best herds and clients is an important challenge for large animal veterinary practice. This review focuses on the control of reproduction in elite herds, but this is only a component of the whole-farm management package, which should be the goal of veterinary practice.

Communicating the value or cost-to-benefit ratio of veterinary services is a key feature for the success of herd health programmes. There are innovative fee structures for reproductive health programmes that make the provision of the service more attractive, including contract fees or a price per litre of milk sold by the herd.

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1090-0233/$ - see front matter © 2004 Elsevier Ltd. All rights reserved.
doi:10.1016/j.tvjl.2004.06.008

Veterinary management of reproduction is most likely to succeed if the service is characterised by facilitation, where both client and veterinarian work toward common goals for the benefit of both partners.

The key structure for the delivery of veterinary control of reproduction is based on the herd health cycle (Fig. 1). The details of the current approach to monitoring and evaluating reproduction are readily available in textbooks (Brand and Varner, 1997; Parkinson and Noakes, 2001). The aims of the present review are to outline the important parts of a herd health programme and identify the challenges for managing reproduction for elite herds. Furthermore, we will highlight the gaps in knowledge that deserve particular attention by veterinarians delivering reproductive control programmes to elite herds.

2. Current programmes for control of reproduction

2.1. Planning

Planning is the first step in the herd health cycle and should focus on the aims of the client, with the veterinarian formulating appropriate objectives. A team approach at the planning stage may include other specialist advisors such as nutritionalists and accountants (Weinand and Conlin, 2003). A useful starting point is the analysis of strengths, weaknesses, opportunities and threats (SWOT). Examining the data from a previous breeding season also facilitates the setting of objectives. The goals and objectives are specific to each farm and should be "SMART" – specific, measurable, attainable, relevant and time-limited. Finally, with some leeway, interference levels should be set where the performance is regarded as a cause for concern and will trigger further investigation.

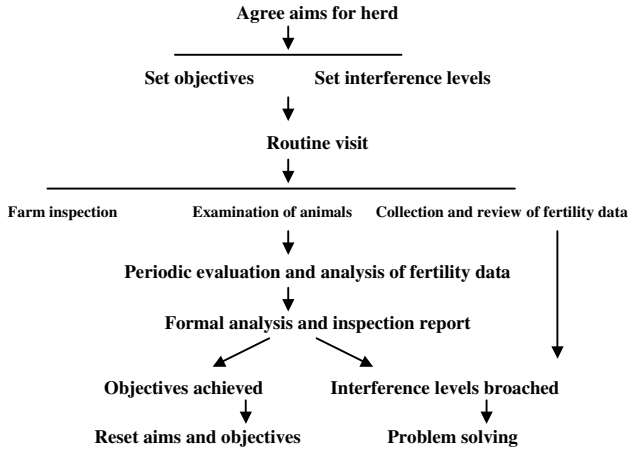

Fig. 1. Flow chart representing the typical herd health cycle for veterinary control of reproduction in elite herds.

2.2. Data collection and evaluation

For effective data collection, and indeed animal examination, there must be accurate and clear animal identification. The core data that should be collected are calving date, dates of insemination, confirmation of pregnancy and details of animals culled. From this information, most of the traditional measures of fertility can be calculated such as submission and conception rates, calving to first service and calving to conception intervals (MAFF, 1984). However in some situations alternative measures of reproductive performance may be more appropriate, such as 100 day-in-calf and 200 day-not-in-calf rate (www.incalf.com.au). The use of a computer and specialist analysis programs save time and effort, and allow integration with other data such as sire, diet, milk quality and yield. It is important to evaluate the data frequently so that intervention is timely, particularly if interference levels are broached. Finally, communication with the farm team is essential for motivation and fostering a team effort. The data should be discussed verbally at each farm visit, and reinforced by strategic written reports. A common format for such reports is to summarise the performance data and compare them to the agreed objectives, and then list in the order of importance the recommendations for action. Communication is facilitated by visual presentation of data; the cumulative-sum (Cu-sum) graph for submission of animals for insemination or for conception is particularly useful.

If a team approach is used, they should meet frequently and regularly; at least quarterly. Furthermore, the advice by the team members to the farmer should be consistent and accord with the overall aims (Weinand and Conlin, 2003).

2.3. Reproductive examination of animals

Regular routine visits to a farm to perform reproductive examinations and farm inspections are the foundations of herd health programmes. The selection procedures for animals to be presented for examination should be agreed at the outset of a programme and reviewed in the light of progress. Commonly, the first examination is made after 21 days postpartum and the cow is re-examined if not inseminated by 24 days after the end of the voluntary waiting period. The responsibility for selection may fall to the farmer alone, but veterinarians who provide a data analysis bureau service will share the responsibility; clearly this requires good two-way communication.

Examination of each animal should be performed efficiently and be thorough, including body condition score, external inspection, vaginal examination, transrectal palpation and, in the 21st Century, ultrasonography of the genital tract. A record of the findings,