THE AFS - A TROPICAL DAIRY CATTLE EXPORT RESOURCE

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SUMMARY

The AFS (Australian Friesian Sahiwal) breed of tropical dairy cattle has been developed as a breed suitable for the harsh conditions of the tropics. It is tick resistant, heat tolerant and has superior performance, relative to Bos taurus cattle, in both milk production and reproduction under tropical conditions.

The development of the breed has progressed through three major stages, namely a culling of F1 cows with milk let-down problems, conventional bull proving and a multiple ovulation and embryo transfer (MOET) program.

Genetic material of the AFS breed is available for export as semen, embryos and live cattle as purebred AFS and Appendix 3 (AFS x Holstein-Friesian) heifers.

INTRODUCTION

The development of the AFS (Australian Friesian Sahiwal) breed of tropical dairy cattle began in 1961 when Sahiwal bulls were crossed to Holstein-Friesian cows to develop dairy cattle suitable for the tropics which had the milk production ability of the Holstein-Friesian combined with the tropical adaptation of the Sahiwal breed.

A 50-50 mix of Holstein-Friesian and Sahiwal genes was decided on to give optimum milk production combined with maximum tick resistance in case of acaricide failure in the future. Later studies confirmed that this mix of Bos taurus and Bos indicus genes was also the most suitable under harsh, tropical conditions.

These studies were conducted on the Indian subcontinent (Amble and Jain 1967, Sharma et al 1982, Raheja and Bhat 1982, Syrstad 1985), Brazil (Madalena 1981, Teodoro et al 1984) and Malaysia (Sivasupramaniam et al 1983, Cheah and Kumar 1984). The reports indicated that the 50-50 mix of genes was superior to higher levels of either temperate or tropical breeds in terms of milk production, age at first calving, intercalving interval and milk production per day of intercalving interval when dairy cattle were exposed to high levels of temperature and humidity, ticks and other parasites and poor quality tropical pastures.

DEVELOPMENT OF THE BREED

The development of the breed has undergone three distinct stages.

These have been:-

(i) Culling of F1 (first-cross) females to eliminate problems due to failure to let down milk;

(ii) Progeny testing of young bulls to ensure genetically superior bulls were available for use through artificial insemination;

(iii) More rapid development of the breed using a multiple ovulation and embryo transfer (MOET) program and evaluation of future sires and dairies amongst MOET progeny.

These stages in the development of the breed have been discussed in more detail by Alexander and Tierney (1990). They reported that the milk let-down problem associated with up to 60% of all F1 Bos taurus x Bos indicus dairy cows had been eliminated. Progeny testing had been successful in identifying a number of proven bulls for use within tropical dairy industries and the MOET program had been successful in producing superior heifers for use in the program and superior young bulls for use both within the program and as proven sires.

Anaman and McMeniman (1990) conducted an evaluation of the AFS breed under on-farm conditions in tropical northern Australia. They concluded that under 1988 economic conditions, where the farmer's share of the retail price of whole milk was 76%, the AFS had a net present value of income from a milking cow of $285. This compared with $-27 for the Holstein-Friesian and $-652 for a group of other dairy breeds. If the farmer's share of the retail price of whole milk rose to 88%, the net present values of income for the three breed groups rose to $1114, $596 and $-249 respectively.

The success of the MOET program in improving the genetic merit of the AFS nucleus herd can be demonstrated by looking at the Australian Breeding Values (ABVs) of cows and heifers which were in the herd at July 1991. The average ABVs of 73 cows born prior to the commencement of the MOET programs were +36 litres of milk and +2kg of fat plus protein, while those for 108 cows and heifers born after the commencement of the MOET program were +117 litres of milk and +7kg of fat plus protein.

DEMAND FOR AFS GENETICS

In recent years the demand for AFS genetics has grown dramatically as there has been an increasing awareness of the potential of AFS dairy cattle under tropical conditions. This demand has come principally from South-East Asia, the Indian subcontinent and Central and South America.

Prior to the first availability of proven AFS semen in the early 1980s, most of the demand for AFS-type genetics was met by F1 Sahiwal x Holstein-Friesian cattle from New Zealand.

These cattle have formed the basis of improved tropical dairy cattle in most of the areas listed above. They have, however, been subject to problems with up to 60 per cent of cows failing to let down milk when machine milked in the absence of the calf. This is a common problem with F1 cattle.

There has also been a problem in determining what semen to use over these F1 cows and heifers. With many of the cattle going into small holder situations with only 4 or 5 cows per farm it is virtually impossible to conduct a progeny testing program because of problems with getting adequate comparisons of progeny of different sires within herds.

AFS genetics overcomes both these problems. By strict culling of all heifers which failed to let down milk under machine milking conditions in the absence of the calf, let-down problems have effectively been eliminated in the AFS breed (Alexander and Tierney 1990).

Further, the on-going bull proving and MOET programs within the AFS breed ensure that the genetic improvement that is being made in these programs can be utilised by dairy industries in tropical countries.

This has led to a strong demand for semen from proven AFS bulls with approximately 60,000 doses of semen being sold in the last 12 months. Most of this semen has been sold into Thailand, Mexico and India.

METHODS OF SUPPLYING AFS GENETICS

There are a number of options for supplying AFS genetics, all of which can be currently met from Australia.

Semen

Proven semen has long been a common method of exporting genetic material around the world. AFS semen is available from both progeny tested proven bulls and MOET tested proven bulls.

The MOET tested bulls have proofs with lower reliabilities than progeny tested proven bulls, but have the advantage of obtaining their proofs at approximately 3 years of age, compared with progeny tested proven bulls at 6 to 7 years of age.

When using MOET tested bulls, a range of bulls should be used to compensate for the lower reliability of the proofs.

Semen can be used to grade-up local cattle, to mate to F1 cattle which have been imported in the past, or to give a level of tropical adaptation in progeny of purebred Bos taurus cattle, such as Holstein-Friesians.

Embryos

Embryos provide a rapid means of supplying purebred AFS genetics to tropical dairying countries and are now available from purebred AFS cows mated to proven AFS bulls. They are relatively cheap to transport and can provide a safe means of transporting genetics from one country to another.

In many tropical dairying industries adequate feeding and management can be a problem. These matters need to be addressed by both importers and exporters if successful embryo transfer programs are to be put in place.

Live animals

Due to the dairy industry in Australia being restricted to better environments, AFS cows are generally not run on Australian dairy farms except for two or three farms in the Northern Territory and northern Western Australia. There are, therefore, very few surplus AFS purebred cattle available for export from Australia.

To meet the export market for AFS-type heifers, contract matings are being arranged in Australia, involving herd recorded Holstein-Friesian cows being mated to proven AFS bulls. These Appendix 3 AFS (AFS x Holstein - Friesian) heifers can then be mated to proven AFS bulls again and grading up can take place from Appendix 2 (AFS x Appendix 3) to Appendix 1 (AFS x Appendix 2) and finally to purebred AFS (AFS x Appendix 1) cows.

Over a number of years, data from smallholder herds could be used to determine the best level of AFS genetics for particular regions in importing countries.

Various options exist for the supply of heifers. These options include heifers at 3 to 5 months of age, heifers at 6 to 10 months of age or heifers confirmed pregnant at 18 to 20 months of age.

Each option has different implications in relation to transport costs and management systems required in the importing country with export at younger ages reducing transport costs, but requiring better management to ensure adequate growth to mating age.

General

Regardless of which method is used to export AFS genetics to tropical dairying countries, it is essential that adequate feeding and management programs are in place in the importing country.

To ensure continued exports, exporters should ensure that adequate training and consultancy packages are built into export contracts. If this is not done the genetic material is usually incorrectly blamed for failed projects and future exports are placed in jeopardy.

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