Livestock production in Malaysia contributes 0.71% to the nation’s gross domestic product and has seen continual growth over the years. The country’s self-sufficiency in beef, mutton, and milk is at 29.77%, 13.45% and 9.30%, respectively, indicating the potential for this industry to further develop. Artificial insemination as a means of improving the breeding stock and increasing the number of animals has been implemented since 1976 but local demands for ruminant products are unable to be met as yet due to issues regarding suitable breeding stocks, complications in their adaptations, and disease prevention. The implementation of other assisted reproductive technologies like embryo transfer and in-vitro fertilization may prove vital in addressing these issues as well as to help cope with the increasing demand for ruminant products.

Keywords: Ruminant products, Artificial insemination, Embryo transfer, Breeding stock, Malaysia

INTRODUCTION

The ruminant livestock population in Malaysia is currently comprised of an estimated 751,781 cattle, 482,280 goats, 129,850 sheep, and 118,045 heads of buffalores. In the year 2010, the agricultural sector made up 7.3% of the gross domestic product (GDP) with the livestock industry contributing 11.5% of the total agricultural output. The involvement of the livestock industry in the GDP of the country is small but it has continually grown over the years from 0.65% in 1990 to 0.71% in 2010 (Government of Malaysia Economics Reports 1995 and 2005). In 2013, the nation’s self-sufficiency for beef was at 29.77%, mutton at 13.45%, and milk at 9.30% which was still lacking to meet the goal of 40% for beef and 35% for mutton (DVS 2014).

BEEF, DAIRY, AND MUTTON PRODUCTION

Beef breeds that are used for artificial insemination (AI) in Malaysia consist of Brahman, Charolais, Droughtmaster, Nelore, Limousin, Boran, Bali, Belgian Blue, Kedah-Kelantan (local indigenous breed), and Angus while dairy cattle breeds are Holstein, Sahiwal, Girolando, Mafriwal (Malaysian Friesian Sahiwal), and Jersey (STPP 2008). There is not much development in the dairy cattle sector compared to beef cattle due to the high cost of developing pastures from virgin or secondary jungle, absence of proper land for grazing, the lack of developed range areas, and the low involvement of the private sector in large scale commercial productions (Mohamed 2007). Goat breeds used for AI are Boer, Jamnapari, Saanen, Alpine, Katjang (local indigenous breed), and Feral while sheep breeds comprise of Dopper, Siamese Long Tail, Barbados Black Belly, Santa Ines, Morada Nova, Segureña, Southdown, and Dorset (STPP 2008). Goats and sheep play a minor role in the ruminant sector with goats more commonly reared. However, the concept of integrating small ruminants with primary crops in plantation areas has garnered increased interest in their production (Mohamed 2007).

Malaysia has the potential to be an international Halal food hub and this has been assisted with the international marketing geared towards promoting livestock products and industrial livestock-based inputs. The Halal standard is a part of the local food trade specification and has the opportunity to cover the gamut of the consumer market as it is able to supply and include the non-Muslim community as well (Mohamed 2007). This has spurred the nation’s continual involvement in improving the breeding stock and increasing the number of animals.
ASSISTED REPRODUCTIVE TECHNOLOGY

Under numerous Malaysia Plans, the importation of breeding stock and the usage of AI have been done in Malaysia since 1976 to improve the genetics and increase the cattle population (Mohamed 2007). The Breeding and Breeds Technology Section under the division of Livestock Technology Source Development, Ministry of Agriculture Malaysia has the responsibility to increase the genetic quality and standard of livestock in the country by providing breeding services such as advice on breeding and breeds, AI, breeding soundness examination (BSE), fertility inspection of females, and pregnancy checks throughout the country. This section provides support to the local farms, livestock producers, modern agriculture farm projects, and the various state subdivisions of the Department of Veterinary Services (DVS) (STPP 2008).

One of the main producers of semen for AI in Malaysia is Institut Bioteknologi Veterinar Kebangsaan (IBVK; the National Veterinary Biotechnology Institute located in Jerantut, Pahang). This institute is under DVS and its purpose is to encourage the development of the livestock industry by increasing the standard of livestock via the supply of high quality frozen semen for AI activities. It was established in 1990 and has the additional functions of implementing and coordinating activities related to the improvement of livestock genetics via the latest biotechnological applications as well as providing consultation to farms, offering breeding services and conducting research. IBVK also functions as a center for genetic material conservation, in the form of semen, of local livestock namely the Kedah-Kelantan and Bali cattle, and Katjang goats (STPP 2008).

Male animals that are used by IBVK for breeding are tested for brucellosis, salmonellosis, foot and mouth disease, Johne’s disease, tuberculosis, Leptospirosis, Campylobacter, and Trichomoniasis. The collected semen is also screened to ensure that it is free from Infectious Bovine Rhinotracheitis and Bovine Viral Diarrhea virus as well as pathogenic bacteria. The semen quality is ensured to have a minimum of 50% motility and a minimum concentration of $10^6$ motile sperm/straw (STPP 2008). For AI procedures, DVS uses a mixture of imported semen and those collected from animals housed at the facility.

In 2010, there were 19,016 and 872 inseminations done in cattle and goats, respectively, in peninsular Malaysia (STPP 2011). From these, 5,474 choice breed calves and 620 kids, respectively, were obtained whereby 10,997 producers received AI services. Within the last decade, there has been a steady increase in the number of inseminations done in cattle (Figure 1).

CONCLUSION

The increasing trend in meat consumption in the country has prompted the ruminant sector to be given a priority for growth. However, local demands are still unable to be met as the industry continually faces issues with the introduction of suitable breeding stock, complications with their adaptations, and the prevention of disease. The implementation of other assisted reproductive techniques like embryo transfer and in-vitro fertilization needs to be explored to solve the growing demand for ruminant products.

REFERENCES

Government of Malaysia Economics Reports 1995 and 2005
Figure 1: Number of artificial inseminations done in cattle in Peninsular Malaysia between the years 2000 to 2010.