

## **Chapter 1**

### **1.0 INTRODUCTION**

There has been an increasing demand for goat meat and their products in Malaysia whereby per capita consumption of goat meat is approximately 0.8 kg per year and is increasing every year (Appendix 1). This trend is mainly due to increasing in population size and improvement in standard of living in Malaysia. As a result, significant research finding and massive campaign, consumers begin to realize the good quality of goat meat and milk compared to other meat and milk and their products. Goat meat contains less fat compared with the meat from other animals and the goat milk is a complete dietary supplement and is most like human milk in composition (Appendix 2). Goat milk is also utilized to produce cosmetic products. More than 97% of the demand for goat meat is met by importation of mutton from Australia and New Zealand. In 2001, approximately 15,000 metric tonnes of mutton were required per year (Appendix 3); and our country had to spend RM-93.93 million yearly to import mutton to cater the increasing demand (Appendix 4). This means that approximately 500,000 goats have to be slaughtered yearly to meet the demand in Malaysia. In 2001, only 23, 148 goats (360 metric tonnes) were slaughtered and this trend is decreasing every year (Appendix 5). In 2001, goat population in Malaysia was approximately 200,000 and the number is decreasing every year (Appendix 6). Since the goat population in Malaysia is very low; with consequent lower slaughtering rate, this clearly suggests that the supply of goat meat is very far below to meet the actual demand. This inevitably results in high price for goat meat in Malaysian market. The average value for goat meat is about RM 18.35 per kg (Appendix 7). There are many

factors that contribute to the poor goat production in Malaysia. The major constraints to increase goat population in Malaysia are related to poor husbandry, infection of diseases, poor nutrition, inbreeding depression, lack of superior breeds and imported breeds cannot survive and adapted well to Malaysian environment. Other factors that may contribute are less government emphasis on animal production, investors are not keen to involve in goat rearing industry due to lower return to investment. Non-commercial farming practices are carried out by the small-holders in rural areas, who lack of modern technologies and local goat breeds with low productivity. The size of the herd is small (5-10 goats per farmer) and is considered as a non-commercial, nonviable small-holder's activity. After economic crisis in 1997, the Malaysian government starts to realize the importance of agriculture and has incorporated agricultural development as an integral component of industrial master plan. Under National Agricultural Policy 3 (NAP 3), Malaysia places a very high priority to produce beef and goat meat to meet the self-sufficiency and possible export. To achieve this, we need to change the goat production system from backyard operation to commercial entity.

Basic requirement for successful for any goat production system are superior breed and optimum management practices. In Malaysia, a synthetic goat breed, Jermasia, was produced by University of Malaya through a joint-venture research between the University of Malaya and the Technical University in Berlin, Germany started in 1981. This new genotype produces more milk and better meat quality compared to local goats. It has a bigger size than our local Katjang thus produce more meat. The high demand for Jermasia goats in a huge number and within a short period

of time could not be fulfilled due to the low number of Jermasia goats at the nucleus farm at University of Malaya. There has been an effort from the Malaysian government, the industry and the university to promote Jermasia goat as one of the commercial goat breeds in the future. In 2005, it is targeted that 500,000 goats to be slaughtered. To produce the number of goats needed in a very short time, advanced reproductive biotechnology such as AI, in vitro fertilization, embryo transfer and cloning need to be applied in our farm practices. Reproduction of animals is controlled by reproductive hormones such as progesterone, oestradiol, LH and FSH. Normal secretion of reproductive hormones is very important to ensure normal reproductive status of the animals. Abnormal oestrous cycle may have resulted from unsynchronous interactions between the reproductive hormones (Abdullah and Nazari,1990). Consequently, abnormal oestrous cycle may result in low reproductive efficiency of the female goats. Currently, scarce information is available on the endocrine aspects of reproduction in Jermasia goats. Therefore, it is imperative to study the patterns of hormone secretions that control the oestrous cycle of the female goats, normal and abnormal oestrous cycles. Oestrus synchronization is a valuable management tool that has been used successfully to improve reproductive efficiency in ruminants. In small ruminants, oestrus synchronization is used to advance the start and decreased the length of the breeding period. Application of methods in goats is very important because in goats the duration of the cycle as well as the duration of oestrus is variable. Oestrus synchronization allows for the efficient application of reproductive technologies in commercial livestock operation. Application of oestrus synchronization has results in increased profit through animal production (milk and

kids), reduction of prenatal mortality and it can also improve flock management under any production system.

The main objectives of this study were:

1. To understand the mechanism of hormonal control of reproduction, with the hope to overcome problems relating to abnormal reproductive status in goats.
2. To compare between the normal and abnormal goats with reference to hormone secretion during oestrous cycles.
3. To characterize the patterns of progesterone and oestradiol hormones in the blood of different goat genotypes with normal and abnormal oestrous cycles and after oestrus synchronization.