CHAPTER I

General Introduction

1.1. Foreword

In Thailand, the majority of the population (70%) are farmers who live in rural areas where agriculture offers the major source of income and livelihood. The agricultural system is characterized by integrated use of several crop and livestock, predominantly on a small-scale level. Amongest livestock species cattle and buffalo are most common. These are mainly of indigenous origin and well adapted to the environment (Faarungsang, 2004). They are highly capable of utilizing agricultural waste products or low quality feed for conversion into meat and provide manure for fertilizer. Furthermore, excess animals can be sold for cash (FAO, 2000).

The world buffalo population is estimated to be 177 million (FAOSTAT, 2006) of which nearly 170 million are in Asia (more than 95%) and the remaining are found in Africa (3.90 million) and South America (1.3 million). In fact, in Thailand the buffalo population is decreasing dramatically (Nanda and Nakao, 2003; Ingawale and Dhoble, 2004). Of all buffaloes roughly 97 percent are water buffaloes which are mostly found in Asia; more than half in India. Water buffaloes can be grouped into (i) River type and (ii) Swamp type (FAO, 2000; Faarungsang, 2004; Lemcke, 2006). The latter are more suited for regions of rice cultivation and like muddling. Hence this type is predominant in the rice producing countries of South-East Asia. In Thailand the swamp buffalo is indigenous. Generally they are completely black in color which makes them heat intolerant. For that reason they have to be kept under swampy conditions (FAO, 2000; Faarungsang, 2004; Lemcke, 2006). Characteristics of Thai buffaloes are longevity and prolificacy. Female buffaloes can have healthy offspring even at an age of 20 or more. Both males and females are used as drought animals, especially in the Northeastern part of the country (Khajarern and Khajarern, 1990; Wanapat, 2001; Faarungsang, 2004). During the non-machinery farming period, in Thai society buffaloes used to play an important role as draught animals and as a source of meat. With mechanization progressing in Thailand during the past decade the number of buffaloes in the country declined dramatically (Na-Chianmai, 2002). This decline applies to beef and dairy cattle as well. At present, buffaloes are kept on small farms with, on average, 3 animals per household. The main reason for keeping them is their adaptation to conditions of extensive grazing and low feed input. Buffaloes kept under feedlot conditions are rarely found (Faarungsang, 2004). Unlike river buffaloes, Thai swamp buffaloes have a very low milk production and are never milked for human consumption, although it is known that buffalo

milk is of high quality with 12% white fat (Faarungsang, 2004). The potential for meat production, i.e. growth, feed efficiency, conversion rate, dressing percentage, carcass quality and composition and meat quality (Ichinohe et al., 2004), is economically important. In marketing buffalo meat, enjoys high priority over quantity. Thus, growth performance is neglected in favor of quality improvement of the chemical, physical and hygienic characteristics and better presentation to the consumer (Neath et al., 2007). Buffalo meat is generally leaner and lower in cholesterol than beef (Nanda and Nakao, 2003). At the same age of the animals, buffalo meat contains less fat than beef cattle. There is a paucity of hard data on the production of buffalo meat in Thailand (Khajarern and Khajarern, 1990; Soares and Arêas, 1995; Wanapat, 2001). The acceptability of buffalo meat by consumers is comparable to that of beef and, because they are of comparable body size, it is practicable to use the same production lines in slaughterhouses. It appears opportune to study *post mortem* transformations in buffalo meat so as to have the necessary information for optimizing slaughter conditions and processing of buffalo meat.

The objective of the present study was to compare carcass characteristics, meat quality and fatty acid profiles (as defined by nutritional composition, physical and sensory properties) in swamp buffaloes grazed on pasture consisting of grass, of grass mixed with legumes, or receiving different levels of concentrate during the fattening period. Particular attention was given to

1. growth performance
2. carcass characters and meat quality.

References

Faarungsang, S. (2004). Thai swamp buffalo general information. The Chinese Society of Animal Science, 2003. http://www.angrin.tlri.gov.tw/apec2003/Chapter1Thai.pdf (14/05/2007)

FAO (Food and Agriculture Organization). (2000). Water buffalo: an asset undervalued. pp. 1-6. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand.

FAOSTAT. (2006). FAOSTAT Agriculture data. Food and Agriculture Organization Statistics, Rome, Italy.

Ichinole, T., E.A. Orden, A.N. Del Barrio, R.M. Lapitan, T. Fujihara, L.C. Cruz and Y. Kanai. (2004). Comparison of voluntary feed intake, rumen passage and degradation kinetics between crossbred Brahman cattle (*Bos indicus*) and swamp buffaloes (*Bubalus bubalis*) fed a fattening diet based on corn silage. Animal Science Journal, 75, 533-540.

Ingawale, M.V. and R.L. Dhoble. (2004). Buffalo reproduction in India: An overiew. Buffalo Bulletin, 23, 1.

Khajarern, S. and J.M. Khajarern. (1990). Feeding swamp buffalo for milk production. Feeding dairy cows in the tropics. FAO Animal Production and Health Paper, 86, 115-126.

Lemcke, B. (2006). Water buffalo farming in Southern Australia. In:Hyde k (ed).The New Rural Industries-a Handbook for Farmers and Investors. Rural Industeies Research and Development Corporation, Sydney, Australia.

Na-Chiangmai, A. (2002). Current situation and development trends of beef production in Thailand. Development strategies for genetic evaluation for beef production in developing countries. In: Proceedings of an International Workshop held in Khon Kaen Province, Thailand, July 23-28 2011. ACIAR Proceedings No. 108, 93-97.

Nanda, A.S. and T. Nakao. (2003). Role of buffalo in the socioeconomic development of rural Asia: Current status and future prospectus. Animal Science Journal, 74, 443-455.

Neath, K.E., A.N. Del Barrio, R.M. Lapitan, J.R.V. Herrera, L.C. Cruz, T. Fujihara, S. Muroya, K. Chikuni, M. Hirabayashi and Y. Kanai. (2007). Difference in tenderness and pH decline between water buffalo meat and beef during postmortem aging. Meat Science, 75, 499-505.

Soares, G.J.D. and J.A.G. Arêas. (1995). Effect of electrical stimulation on Post Mortem biochemical characteristics and quality of Longissimus dorsi thoracis muscle from buffalo (*Bubalus bubalis*). Meat Science, 41, 369-379.

Wanapat, M. (2001). Swamp buffalo rumen ecology and its manipulation. Proceedings of the national workshop on swamp buffalo development, 16-17 December 2001, pp.1-15. Hanoi, Vietnam.