

CHAPTER 1

INTRODUCTION

Since the turn of the century, beef cattle production in Vietnam has developed rapidly. In 2000, Vietnam's slaughtered cattle accounted for 541,000 heads and increased to 696,000 heads in 2004 and 1,200,000 heads in 2008, supplying 92,268 tons, 119,789 tons, and 206,145 tons of beef meat, respectively (FAO, 2010). In 2006, there were a total of 3,404 breeding and beef cattle farms in Vietnam, with 1,064 farms (31.3%) located in the North and 2,340 farms (68.7%) in the Middle and South of Vietnam (Department of Animal Husbandry, 2006). Despite the increase in cattle heads, the production of beef meat in Vietnam does currently not fulfil the domestic demand, and imports of beef are expected to grow continuously to meet local beef meat consumption in the future (GAIN, 2006).

About 70% of the total cattle population are Yellow cattle (Ly, 2004; Department of Animal Husbandry, 2006). They are small-framed cattle and have a rather slow growth rate. Adult weight of male and female cattle is in the range of 180-300 kg and 150-200 kg, respectively (Burns et al., 2002, Department of Animal Husbandry, 2006). Dressing percentage is as low as 43-44% of live weight.

In order to improve the productivity, draught power and milk production of cattle, Vietnam has imported many exotic animal breeds and semen, such as Red Sindhi, Sahiwal, Brahman, Charolais, Limousine, Hereford, Simmental, Santa Gertrudis, Droughtmaster, Belmont Red, Red Brangus, Red Brahman, Jersey and Holstein Friesians (HF) (Vang, 2003). A "Zebuization" programme is taking place since 1994, in which local cows are crossed with Red Sindhi or Ongole bulls to create the

Laisindh. To improve dairy production the Laisindh is further crossed to HF, whereas to improve beef production or to improve draught power, it is crossed with Charolais, Limousine, Hereford or Brahman bulls (Valle Zárate et al., 2006). These measures resulted in the ratio of Laisindh rising to 25% in the total herds in 2002 and 30% in 2006 (Ly, 2004; Department of Animal Husbandry, 2006). In Son La, the “Zebuization” programme was implemented in five districts along six roads. At the beginning of the programme, 50 Zebu crossbred bulls and 14,600 local cows were selected for natural mating or artificial insemination. In 2009, all of the 10 districts and the capital town in the province participated in the project. A total of 250 Zebu crossbred bulls were selected and 20,000 calves were born. The average weight of newborns was 25 kg, twice as much as the average birth weight of local cattle; and one year old calves from the project averaged 220 kg, a higher weight than that of the local breed with 85 kg (Van, 2009).

Zebu crossbreds (mostly Laisindh, Sahiwal and Brahman crosses) are present in almost all provinces of Vietnam. They have a higher growth rate in comparison to Yellow cattle, with an adult weight of 250-290 kg and a dressing percentage of 49-50% (Department of Animal Husbandry, 2006). In some provinces (Tuyen Quang, Ha Tay, Ninh Binh, Thanh Hoa, Binh Dinh, Khanh Hoa, Lam Dong and Ho Chi Minh City), pure Zebus are kept in semi-intensive systems. Pure Zebu cattle have an adult weight of around 400-450 kg and dressing percentage is 49-50 % (Department of Animal Husbandry, 2006). The Laisindh cattle keep playing an important role in Vietnam’s cattle production owing to their adaptation ability to harsh conditions.

The demand for faster growing cattle has increased during the last decades. The preference for cattle of larger frame may be justified to that effect that there is a

favourable correlation between frame size and growth rate in beef cattle (Du Plessis et al., 2005). The trend towards larger framed cattle was due to the desire for a bigger carcass and a leaner product, as well as a more favourable dressing percentage in larger animals. Frame size was incorporated as a primary selection objective in beef cattle for many years. However, selection for larger, faster gaining cattle and its association with increased mature body size may be negatively affected with key reproductive performance traits (Vargas, 2000).

In addition, significant genotype x environment (GxE) interactions have been reported. Buttram and Willham (1989) suggested that the size of the animal and (or) the breed of cattle produced under specific conditions usually depends on the type of management implemented. Hence, the determination of the effect of heifer body size on subsequent reproductive performance within the breed will help to determine potential body sizes of cattle that are more suited to specific environments. Under extensive management conditions with limited inputs, the effect of frame size on female fertility traits may be negative (Taylor et al., 2008). Improper nutrition during the heifer development period may have both, short- and long-term negative effects on heifer productivity. Matching body size of cattle to available resources plays a major role in establishing beef production systems with optimal efficiency (Vargas, 2000).

In Vietnam, about 90% of the total cattle population is raised on small household farms and only 10% is from commercial operations (Tuyen, 2009). Major beef suppliers belong to the North and South Central Coast, whereas the northern mountainous areas of Vietnam in contrast only supply a small amount of beef due to a large share of draught bulls in the region (Department of Animal Husbandry, 2006).

The development of the beef cattle industry in Vietnam is facing some constraints, such as lack of good quality cattle breeds, unstable market prices for live cattle, lack of breeding knowledge, lack of advanced technology in artificial insemination, insufficient grazing areas with appropriate grass varieties, lack of knowledge in cattle nutrition and scarce veterinary services. So far, Vietnam's government does not have a specific programme for beef cattle development as compared to the Government's Decision No 167/2001/QĐ-TTg (26/10/2001) on solutions and policies to develop dairy cattle in Vietnam up to the year 2010 (Department of Animal Husbandry, 2006).

Since 2003, new breeding farms have been established in Son La province with the aim to provide breeding animals to household farms (Son La DARD, 2005). These large-scale farms with specialised beef production had not been evaluated in the past. A study of Huyen et al. (2010) compared beef production of three farm types, i.e. traditional small-scale and medium-scale farms, and specialised large-scale farms. Small-scale farms were defined as smallholder mixed farms with integrated crop and livestock production; medium farms were defined as smallholder mixed farms with a tendency to increase herd size making collective use of natural pastures; and specialised beef breeding farms as large-scale farms. On small and medium farms, Yellow cattle or crossbred Laisindh are integrated with other livestock species and crop production. Small farms are substantially limited in their forage availability and labour input for increasing beef production. Benefits of cattle on these household farms are derived rather from non-market functions of cattle than from direct market values. Large farms on the other hand operate to a great extent with governmental subsidies. These farms represent the newly established beef farms in the North of Vietnam. Previously, no specialised beef production systems had been established in

the northern mountainous regions (Middleton, 1998). The breeds utilised are Brahman, Droughtmaster and Laisindh. High feed costs and inefficient management are major constraints for the profitability of cattle production on these large-scale farms. The identified medium farms showed favourable natural conditions for keeping cattle and hence demonstrate the most promising type of farms for profitable beef production in this region (Huyen et al., 2010).

In the north of Vietnam, cattle production on medium farms basically relies on natural pastures. Cattle are released to communal pastures during the day and come back to the farm at night. In these regions, cattle are kept on pastures located on hilltops, whereas farm households reside in the valleys. No crop by-products are utilised as cattle feed (Huyen et al., 2010).

In the study area, medium farms are expected to have a potential for development. Due to the geographical and historical conditions, Yellow cattle are the predominant breed kept in this area. The present study aims to investigate currently applied feeding strategies and cattle husbandry management with natural pastures in the remote upland areas in Son La province, Northern Vietnam. Feeding trials were conducted to evaluate the best combination between different types of Yellow cattle and the suitable feeding and husbandry management for a sustainable development of beef cattle production in the region.

The following objectives were pursued:

- To investigate the current situation of feeding resources and husbandry management that is applied by farmers in the study region.

- To study the effect of supplementation of urea-treated rice straw (UTRS) and urea-molasses multinutrient blocks (UMMB) on growth rate of two distinct groups of growing cattle.
- To compare the efficiency of applying different husbandry managements (cut-and-carry system, supplementary feed at night and the current traditional feeding system).
- To figure out the most suitable cattle frame size, feeding strategy and husbandry management in the study region.

The following hypotheses were formulated for the present study:

- Feed supplement will improve the performance of growing cattle in comparison with traditional grazing on pasture.
- Application of urea and molasses on crop by-products (e.g. urea-treated rice straw, urea-molasses multinutrient blocks) can improve the quality of feed resources for cattle in the dry season.
- Matching body size of cattle to available resources and husbandry management will result in an efficient utilisation of resources.