Research article

Constraints on Small Scale Cattle Production in Kandal Province, Cambodia

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Abstract This study was conducted in Kandal Steng and Saang District, Kandal Province, Cambodia, to determine the constraints on small scale cattle production in this area. Sixty small holding cattle keepers were interviewed using semi-structure questionnaires. Faeces samples from 80 cattle were selected and subjected to intestinal parasite investigation at the Royal University of Agriculture Laboratory. Cattle are kept for draught power and reproduction purposes. Crossbreed animal types were dominant in these areas. The average herd size is 2.5, ranging from 2 to 3 heads. Eighty five of respondents practiced vaccination and 26% de-worming. However, the Foot and Mouth Disease (FMD) and Haemorrhage Septicaemia disease usually occurred as it was mentioned by farmers. Five types of parasites (Fasciola, Paramphystomum, Gastro-intestinal strong (GIS), Eimeria and Toxocara) had been detected; majority of GIS (68%) was found in feaces. The farmers expressed that the major constraints to cattle production are disease outbreak (95%), lack of feed (35%) and that price of cattle is low (26%). In order to improve livestock production at small scale level, animal health services for vaccination and treatment should be strengthened and animal bio-security management should be applied. Technical support should be in place, in order to encourage farmers to provide proper feeding management, sufficient amount and quality of food so that growth rate, reproductive performance and disease resistance of animals can be improved.

Keywords cattle, management, feeding, parasite

INTRODUCTION

In Cambodia, large ruminants play an important role in the agricultural sector of rural areas, providing draught power, organic fertilizer, and cash accumulation (Pen et al., 2009). Livestock are raised through traditional management methods, such as rice straw and other seasonal crop residues usually used for the main feed (Maclean, 1998; Pen et al., 2009; and Sath et al., 2008). During the dry period, major grazing activities take place (Sath et al., 2008) exposing animals to disease and internal parasites (Keyyu et al., 2005), especially the calves which are more vulnerable.

Recently, the number of cattle in the province had significantly decreased due to; the incidence of infectious diseases, an increased use of land for cropping and an increase in the use of machiner-

ies for land preparation and transportation reducing the need for draught power. In addition, labor demands for feeding the animals are relatively high, consequently, some farmers decided to reduce the herd size (Pen et al., 2009). In order to identify the situation of cattle production and intestinal parasite investigation among farmers with small holdings, this study was conducted in Kandal Steng and Saang District, Kandal Province.

MATERIALS AND METHODS

Study site

The survey and internal parasites investigation were conducted as a baseline study for the project "Establishment of *Leucaena leucocephala* and *Gliricidia sepium* as forage supplementation for cattle of small scale farmers in Kandal Province" carried out between Royal University of Agriculture (RUA) and Cambodia Agriculture Research Fund (CARF). The study started from March 18 to April 18, 2010 in Kandalsteng and Saang districts, where small producers handle cattle for crop farming systems. These areas lay on a flat land in Kandal province, 12 km and 25 km from Phnom Penh city, respectively. 60 households were selected for individual interview on animal production aspects and 80 cattle were chosen for intestinal parasite study.

Sampling procedure for baseline study

Randomized sample of correspondents among small scale cattle keepers were selected. Twenty producers in each commune, Koktrop and Ampovprey (Kandal Steng district) and Krangyov (Saang district) were chosen. Equal number of adoption forage and non-adoption forage farmers was selected. Krangyov is the busiest farming area among all selected sites, where farmers cultivated rice almost 3 times per year.

Data collection for parasites study

Faeces samples for intestinal parasites identification were collected from the animals owned by the same recipients in Kandalsteng district (Koktrop and Ampovprey village). The samples were harvested from rectum with new unused gloves for each animal and stored at 4 ^{0}C in a refrigerator and analyzed within 3 days. Faecal samples were examined for the presence of parasite eggs, namely: Fasciola, Paramphystomum, Gastro-intestinal strong (GIS), Eimeria (Coccidiosis) and Toxocara.

RESULTS

Herd size and breed

In the study sites, rice was the staple crop for securing villagers' livelihood, whereas livestock was the second sources of food, draught power and income generation. Compared to other species (pigs and poultry), cattle were present in highest number in those areas (Fig. 1). The average number of animals per household was approximately 2.5 head, which is similar to the finding of Maclean (1998). The herd size varied according to the farming aspect, in Krangyov, 35 percent of correspondents raised 4 animals whereas only 10 and 20% in Apovprey and Koktrop (Table 1).

The crossbred animal was the dominant breed type found in these study sites (Fig. 2). The characteristics of this breed were similar, as described by Sath et al., 2008. Villagers selected bulls (Haryana) in their area for natural mating with local types. According to the farmers, crossbreed cattle show significant difference in body condition and usually fit with labor work. Moreover, the traders usually put their high interest and demand on crossbreed cattle. Majority of livestock were purchased by neighboring villagers (Fig. 3). Approximately 36% of live animals were sold for draught power rather than for breeding or slaughter. The male animals were temporary kept and

tended to be replaced when the holders were able to gain more profit. Traditionally, farmers in these areas sold their draught animal after rice harvesting (January to February). Later, they were looking for new animals in the early rainy season (April to May). The holders confirmed that during the dry season, frequently, animals lack feed and it was uneconomic to keep unused-animals.

Table 1 Average of households (Head/hs) keeping in Kandal province

Herd size (head)	Households (%)			
	Koktrop	Ampovprey	Krangyov	Means
1	15	25	15	18.3
2	45	20	5	23.3
3	20	25	25	23.3
4	20	10	35	21.7
5	0	20	10	10.0
5<	0	0	10	3.3

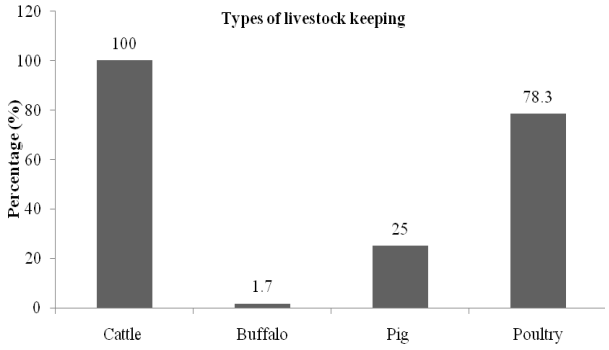

Fig. 1 Types of livestock kept

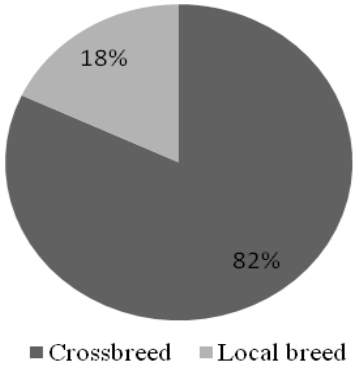

Fig. 2 Breed preference

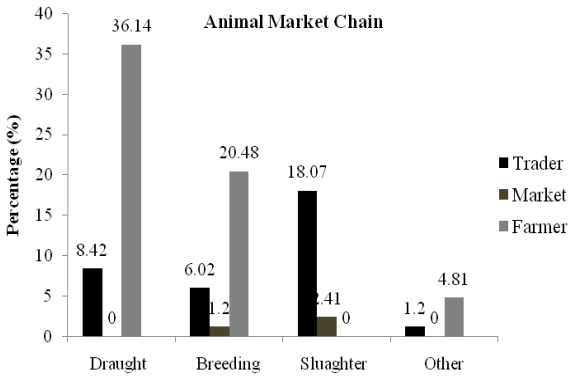

Fig. 3 Animals Market Chains defining the major constraint of animals production

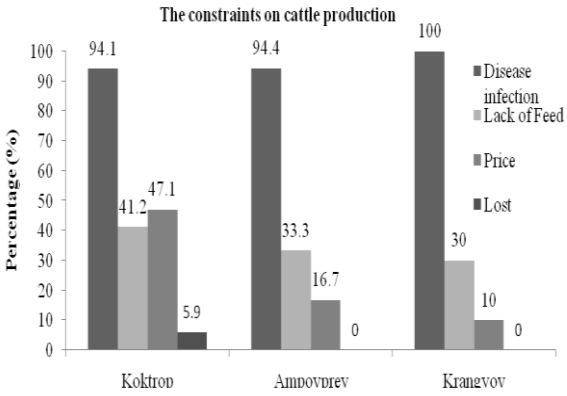

Fig. 4 Constraints on cattle production

Disease was identified in the survey as the major problem (95%) which limits the production whereas feed supply (35%) and market price (26%) were considered to be less important (Fig. 4). Most farmers reported that Foot and Mouth disease and hemorrhages septicemia were regularly occurring even though eighty five percent of them attempted to use vaccinations (Fig.5).

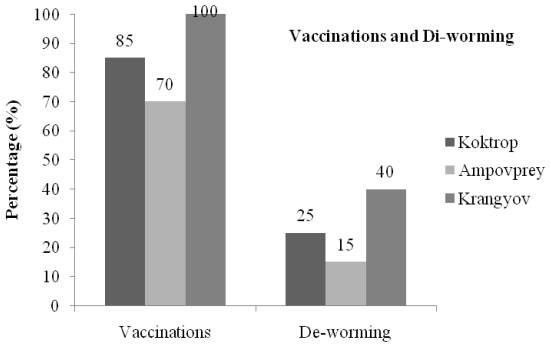

Fig. 5 Vaccinations and deworming

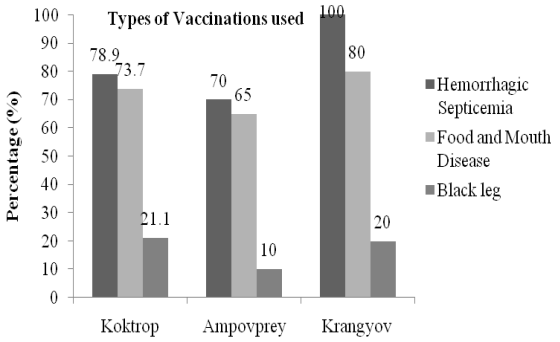

Fig. 6 Types of vaccinations used

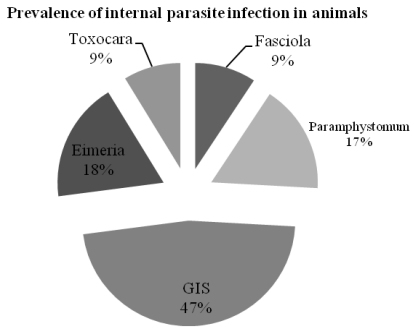

Fig. 7 Prevalence of internal parasite infection on animals

The transmission of infectious diseases increased when the diet failed to meet the energy and nutrient requirements of the animal (Ben et al., 2006; Daovy et al., 2008). Thus the host is more susceptible to infection when fed a low quality feed. As can be seen in this study, majority of producers were using rice straw low quality based-diet annually, particularly in Krangyov (Figs. 8 and 9). Similarly to Sath et al. (2008), when the rice fields were vacant, grazing activities in the selected sites highly increased in dry period, especially in Koktrop and Ampovprey. Collected native grasses were almost twice in raining season for all selected villages. In Krongyov, paddy rice fields were cultivated almost three times per year; hence native grass can be harvested on the edge of rice field boundaries. Interestingly, some families in that area allocated their land close to their residential land for Para-grass planting. This forage was not only used for feeding their animals, but also for selling to the other neighboring cattle holders. A bunch of cut grass accounted 1000 Riels.

Although deworming treatment for preventing five types of parasites (Fasciola, Paramphystomum, Gastro-intestinal strong (GIS), Eimeria and Toxocara) had been conducted (Fig. 5); the majority of worm eggs found were in GIS of 68% (Fig. 7). High presence of GIS can be found in border cattle production in many areas and countries (Keyyu et al., 2005; Swai et al., 2006). Cut and carrying or eventually grazing of natural pastures may increase the opportunity of transmission of internal parasites (Keyyu et al., 2005; Maichomo et al., 2004). However, most of the animals examined during the present survey had low to moderate strongly eggs and Coccidia oocyst counts, meaning that the infections were usually sub-clinical.

Limitation of the herd size was not only due to widespread of disease but also due to the long calving interval (18.5 months) which resulted from lower quantity and quality of feed supply (Pen et al., 2009). In the study areas, calves were weaned approximately 10 months earlier than those in the report of Sath et al., (2008) (12 to 15 months), although this practice of reducing calving intervals was extended to small scale farmers. According to Baiden and Duncan (2008), 3 months weaning can be done in case farmers are fatting cattle for slaughter purpose, however, certain

amount of concentrated feed supplements (grass and legume) may be given in order to gain 330g/day in the 12 months indoors.

Table 2 Prevalence of faecal GIS, Eimeria and Toxocara egg counts in all type and age of animals

Parasites	Range of eggs	Number of examined animals	% of animals that excreted eggs
GIS	None	26	32.5
	50-200	34	42.5
	250-500	18	22.5
	>500	2	2.5
Eimeria	None	59	73.8
	50-200	11	13.7
	250-500	2	2.5
	>500	8	10
Toxocara	None	70	87.5
	50-200	10	12.5

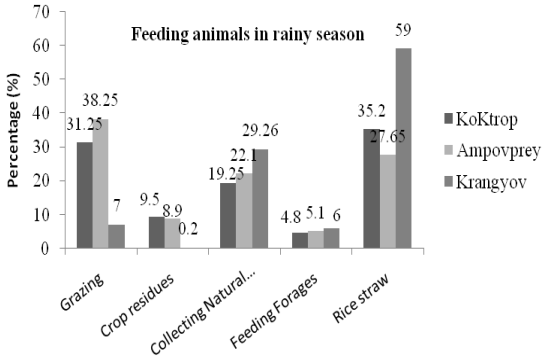

Fig. 8 Feeding animals in rainy season

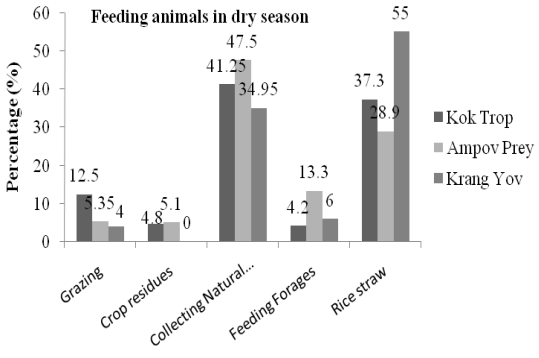

Fig. 9 Feeding animals in dry season

Table 3 Weaning and Castration practices

Calves	Kok trop	Ampov Prey	Krang Yov	Mean	STD
Weaning (Months)	9	12	8	9.7	2.1
Castration (Year)	1.15	1.78	0.45	1.13	0.7

CONCLUSION

Based on the study, followings were concluded;
- Cattle production is linked to farming activities, and the majority of household keep animals from 2-3 heads
- Crossbred are dominant and appropriate for the market demand
- Infectious diseases are influenced by production performance, there is not enough community veterinary service to have emergency support to the farmers
- Feeding is depending on grazing, collecting natural grasses and rice straw
- Improve feed quality, quantity and fattening cattle for slaughterhouse was not consistent, and
- Carrying out traditional weaning are prolonging calving interval.

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