Prevalence of gastro-intestinal strongyles in native beef cattle under small holder management condition in Udon Thani, Thailand

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ABSTRACT: Strongyles (Nematoda, Strongylida) affecting cattle are presently recognized as the most important helminth parasites of these animals. Strongyles are a major cause of economic losses in the beef cattle through abortion, losses in weight and fertility, especially in temperate areas including Udon Thani, Thailand. Thus, we are interested to design a cross-sectional study to investigate the prevalence of gastro-intestinal strongyles infection in beef cattle in Udon Thani, Thailand. The total of 401 faecal samples from beef cattle were examined using the simple floatation technique and Ritchie formalin-ether sedimentation technique to evaluate parasitic eggs. The results showed prevalence of Strongyles 71.32 % (286) *Paramphistomum* spp. 44.64 % (179), *Capillaria* spp. 7.48 % (30), *Trichuris* spp. 1.25% (5), *Strongyloides* spp. 0.75% (3), *Fasciola* spp. 0.45% (2) and *Toxocara* spp. 0.25% (1) were found. These results showed the first evidence of the highest prevalence of Strongyles in small holders farms in Udon Thani, Thailand. Therefore, further studies are needed to investigate the correlation between risk factors, health problems and these emerges in native beef cattle in Udon Thani, Thailand

Keywords: Strongyles, Native beef cattle, Udon Thani

Introduction

Parasitism is a primary cause of production losses in most cattle producing countries of the world. Losses may involve mortality, reduction in weight gain, low fertility, anemia, scouring, depression and even death (Pandey et al., 1993) The almost gastrointestinal parasites of cattle in worldwide are strongyle,GI-nematodes worms are *Haemonchus placei* (barber's pole worm, large stomach worm, wire worm), *Ostertagia ostertagi* (medium or brown stomach worm), *Oesophagostomum* spp. (nodular worm) and *Trichostrongylus axei*. (Rickard and Zimmerman, 1992) and rumen fluke. Other species we can found are *Strongyloides* spp, *Trichuris* spp, *Fasiolar* spp. and coccidian oocyst.

One of Stronyle is *Oesophagostomum radiatum* is very harmful for cattle, especially for stock younger than 2 years: massive infections can be fatal. Infective larvae penetrates the intestinal wall and the host's organism reacts building nodules the size of a pea. This disturbs considerably the physiology of the gut, particularly the absorption of liquids, which causes diarrhea, also the peristaltic movements. Digestion and defecation can be affected, and enteritis is possible. Deadly bacterial infections can happen if larvae migrates to the liver across the abdominal cavity, or if the nodules burst towards the abdominal cavity.

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[*] Corresponding author: Orangebeloved@gmail.com Introduction

Native beef cattle farming is an important economic activity in Thailand, especially those in North-eastern part of Thailand. The effect of parasitism causes economic losses, especially in the small holder farming systems in developing countries. (McDermott et al., 1999)

Materials and Methods

Materials

Study areas

Udon Thani province (**Figure 1**) is at approximately 17°25'N and 102°45'E , 560 kms from Bangkok, capital of Thailand. It covers an area of about 11,730 km^2 and it has a tropical savanna climate. Winter is fairly dry and very warm. Temperatures rise until April, which is hot with the average daily maximum at 36.3 °C (97.3 °F). The monsoon season runs from late-April through early-October, with heavy rain and somewhat cooler temperatures during the day, although nights remain warm. The range of reliably recorded temperatures in the city is from 2.5 °C (36.5 °F) to 43.9 °C (111.0 °F). It is also a major commercial center in northern Isaan and the gateway to Laos, north.

Study design and sampling method

A cross-sectional study was used to determine the prevalence of native beef cattle gastrointestinal parasitic infection originated from small holder management in Udon Thani, Thailand. A survey was carried out 401 samples. The fecal samples of cattles were randomly collected from 8 districts (Meung, Phen, Kutchap, Nongwuaso, Si that, Nonsa-at, Bandung and Namsom) during May 2011- January 2012.

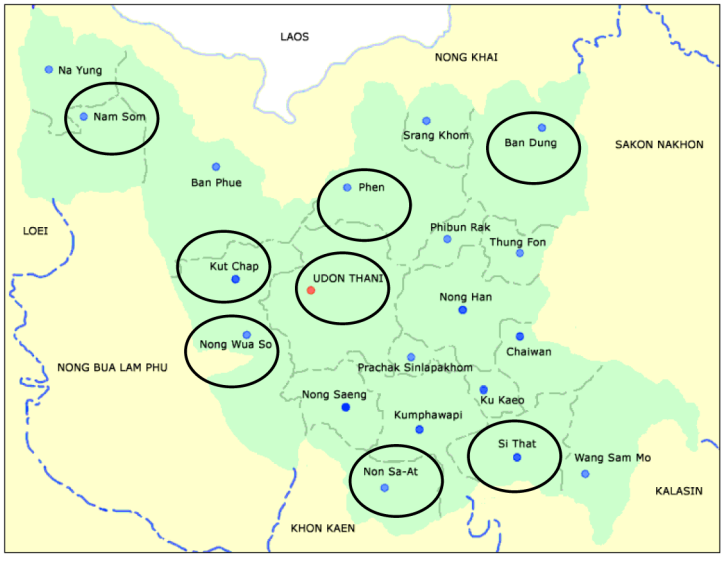

Figure 1 Map showing the study area in Udon Thani.

Methods

Laboratory examination

Faecal samples were microscopically examination for the presence of helminth eggs and oocysts using the simple floatation technique procedure using saturated NaCl (specific gravity = 1.2), following the method described by Soulsby E.J.L. (Soulsby, 1982) and using Ritchie formalin-ether sedimentation technique following the method described by Arcom. (Songvaranond, 1998)

Data analysis

Faecal sample was recorded as positive if at least one egg, oocyst, cyst or thophozoite was observed in the faecal examination method. The overall prevalence rate of beef cattles was calculated and expressed as a percentage using the following equation;

Prevalence = (number of positive samples/ number of sample tested) x 100

The infection status was classified into 3 groups as follows: no infection, single and multiple infections of parasite species.

Result and Discussion

Results

The total of the 401 faecal samples were ollected from 8 districts in Udonthani. The number of sample in each district; Meung, Phen, Kutchap, Nongwuaso, Si that, Nonsa-at, Bandung and Namsom was 93, 49, 26, 75, 32, 50, 51 and 25, respectively **Table 1**. The overall prevalence of intestinal parasites observed in this study was up to 86.75% indicating a very high level of infection. The highest prevalence rate was observed at *Strongyles* spp. Infection with multiple gastrointestinal parasites was commonly observed. One hundred-sixty four (41%) and 183 (45.75%) cattle were being infected with single and multiple species of parasites, respectively **Table 2**. The results showed prevalence of Strongyles 71.32 % (286) *Pa ramphistomum* spp. 44.64 % (179), *Capillaria* spp. 7.48 % (30), *Trichuris* spp. 1.25% (5), *Strongyloides* spp. 0.75% (3), *Fasciola* spp. 0.45% (2) and *Toxocara* spp. 0.25% (1) were found. The data of gastrointestinal parasites species are shown in **Table 3**

Table 1 Distribution of faecal samples of native beef cattle gastrointestinal parasites in each area of Udonthani

Area (district)	No. of samples examination	Prevalence rate (%)
Meung	93	23.20
Phen	49	12.22
Kutchap	26	6.49
Nongwuaso	75	18.71
Si that	32	7.98
Nonsa-at	50	12.47
Bandung	51	12.72
Namsom	25	6.24
Total	401	100

Table 2 Classification of infection status of gastrointestinal parasites based on faecal examination results from eight areas in Udonthani

Infection status	No. of positive sample	Percentage
No infection	54	13.50
Single infection	164	41.0
Multiple infection	183	45.75

Table 3 Classification of gastrointestinal parasites species based on faecal examination results from eight areas in Udonthani

Infection status	No. of positive sample	Percentage
Strongyles	286	71.32
Paramphistomum spp.	179	44.64
Trichuris spp.	5	1.25
Fasciola spp.	2	0.45
Capillaria spp.	30	7.48
Strongyloides spp.	3	0.75
Toxocara spp.	1	0.25
Unsporurated coccidian oocysts	14	3.49

These results showed the first evidence of the highest prevalence of Strongyles in native beef cattle in Udon Thani, Thailand. Therefore, further studies are needed to investigate the correlation between risk factors, health problems and these emerges in native beef cattle in Udon Thani, Thailand

The overall prevalence of intestinal parasites observed in this study was up to 86.75% indicating a very high level of infection. Most of the animals were raised in native pasture grazing systems. That lacked deworming programmes. The highest and lowest prevalence rate was observed at *Strongyles* spp. and *Toxocara* spp in Udon Thani, commonly found in many authors by Morakot Kaewthamasorn and Sakchai Wongsamee. (Kaewthamasorn and Wongsamee, 2006)

However, we observed clinical signs, such as diarrhea and poor body condition. We found almost borderline (condition score 4, found foreribs noticeable ruffing of around ribs, back-bone visible and spinous process palpated) but there was no diarrhea sign. Parasitism is the one cause of economic loss in these smallholder farms, such as *Oesophagostomum* spp. (one of strongyle) is very harmful for cattle. Infective larvae penetrates the intestinal wall and the host's organism reacts building nodules the size of a pea. This disturbs considerably the physiology of the gut, particularly the absorption of liquids, which causes diarrhea, also the peristaltic movements. Digestion and defecation can be affected, and enteritis is possible. Deadly bacterial infections can happen if larvae migrates

to the liver across the abdominal cavity, or if the nodules burst towards the abdominal cavity (Rickard and Zimmerman, 1992)

These results showed a very high level of infection, we might hypothesize that poor management by the farmers, such as sharing the same grazing pasture and the poor sanitation of the animals might be major factors that cause increasing parasitic infections. Therefore, the parasites of cattle should be approached as a herd or group problem rather than a problem of an individual animal. A successful grazing management system needs to be based on appropriate knowledge of the epidemiological conditions for the prevailing parasite infections (Diamander et al., 2003)

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