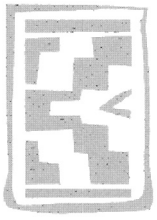

RESEARCH COMMUNICATION

The prevalence of internal and external parasites in pigs of different ages and sexes in Southeast District, Botswana

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ABSTRACT

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Botswana imports most pig-based products from neighbouring countries. Pig farming is limited by, among other things, the negative effect of parasites and diseases on production. The object of this study was to determine the prevalence of ecto- and endoparasites in pigs of different ages and sexes in the Southeast District of Botswana. Thirty-nine pigs were sampled for endoparasites and 19 for ectoparasites during a period of 2½ months. Of all the pigs sampled, 54,55 % were infected with *Ascaris suum*, 20,45 % with *Trichostrongylus* spp. and 6,82 % with *Trichuris suis*. *Ascaris suum* was found to be the most common endoparasite infesting both mature, i.e. 12 months and older, and young, i.e. less than 12 months old, pigs. Although not significantly different ($P > 0,05$), the prevalence of this parasite species was slightly higher (68,42 % with an average of 1 023 ± 545 eggs per gram (EPG) of faeces per pig) in mature than in young pigs (55 % with an of average 1 500 ± 846 EPG of faeces per pig). The prevalence of *Trichostrongylus* spp. was lower in mature (5,26 % with 20 ± 14 EPG of faeces per pig) than in young pigs (25 % with 22 ± 9 EPG of faeces per pig). The prevalence of *T. suis* was also lower in mature (0 % infection) than in young pigs (15 % with 9 ± 4 EPG of faeces per pig). The prevalence of the three endoparasite species was not significantly different between the sexes *A. suum* (1 020 ± 883 v. 1 503 ± 522 EPG of faeces per pig), *Trichostrongylus* spp. (24 ± 14 v. 18 ± 8 EPG of faeces per pig) and *T. suis* (11 ± 6 v. 2 ± 4 EPG of faeces per pig) for male and female pigs respectively. *Sarcoptes scabiei* was the only ectoparasite identified on the pigs sampled for external parasites. It infested 40 % of all pigs but the infestation on young pigs (70 %) was higher than on the mature ones (33,33 %). Since the infection of internal and external parasites was similar in young and old pigs of both sexes, controlling parasites is of great importance since these generally lead to reduced production and are also of public health concern. It is recommended that a further study be carried out to investigate the effect of internal and external parasites on productivity.

Keywords: *Ascaris suum*, internal and external parasites, pigs, *Sarcoptes scabiei*, *Trichostrongylus* spp., *Trichuris suis*

INTRODUCTION

Pig farming is one of the growing enterprises in Botswana. Pig production can yield rapid returns on the capital invested. Pigs need less space in which to be raised, unlike traditional beef cattle farming, which is popular in Botswana, but which requires a large area for production. There are many factors limiting pig farming in Botswana. Among these, possibly the most important one is the negative effect that internal and external parasites have on their production. There is scant information on the prevalence and nature of internal and external parasites of pigs in Botswana with the result that the extent to which they negatively affect production is not known. The object of this study was to determine the prevalence of internal and external parasites in pigs of different ages and sexes in the Southeast District of Botswana.

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MATERIALS AND METHODS

Pigs sampled

The pigs sampled were exotic breeds, Landrace and Large White. These were confined in typical pig houses and were separated into different ages and sexes. Sows and gilts were further separated according to their production status. Due to the small sample size, they were categorized into the following groups; mature, i.e. 12 months and older (n = 14), and young, i.e. 12 months and younger (n = 25) and male (n = 12) and female (n = 27) for the internal parasite study, and for the external parasite study, mature (n = 6) and young (n = 13) of which, six were males and 13 females.

Internal parasites

A total of 39 faecal samples, all from individual pigs, were collected on four separate occasions between 26 March 1999 and 12 June 1999. Between five and 12 samples were collected on each sampling date, the number being determined by availability of manpower and of livestock. In the laboratory, 2 g of faeces were weighed into a clean sampling bottle and then crushed with a spoon. Forty-five glass beads were placed in the crushed faecal sample to further improve crushing. Twenty-eight millimeters of water were added to the bottle, which was then tightly closed and shaken well. The mixture was sieved through a coarse sieve into a clean beaker. The sieved material was mixed well and transferred to centrifuge tubes and then centrifuged for 3 min at 1 500 revolutions per minute. The supernatant fluid was then decanted and saturated aqueous sodium chloride solution was added to fill the tube up to the former level of the decanted supernatant. Using a pipette a McMaster slide was filled and examined for the presence of eggs and oocysts under a light microscope using a 10 x objective lens. These were counted according to the modified McMaster method. Eggs and oocysts occurring on or within the engraved lines on both halves of the slide were counted and the counts multiplied by 50 to get eggs per gram of faeces per pig.

External parasites

Between 26 March 1999 and 12 June 1999, 19 deep skin scrapings were collected from individual pigs using a scalpel blade. Sampling was carried out once a month. Between five and seven samples were collected on each sampling date. One gram of each skin scraping was thoroughly mixed with a small volume of 10% aqueous potassium hydroxide solution. The mixture was put in the water bath and allowed to boil for 15 min in order to allow digestion of tissue so that any parasite present would be released. Enough mixture was pipetted onto a slide, which was then viewed under a light microscope in order to visualize and identify any external parasites present.

STATISTICAL ANALYSIS

Results reported for mean worm egg count are least square means derived from General Linear Models in SAS. Means were judged to be significantly different ($P < 0,05$) based on t-test.

RESULTS AND DISCUSSION

Internal parasites

Three internal parasite species were found to be infecting the pigs, *Ascaris suum, Trichostrongylus* spp. and *Trichuris suis* (Table 1). For all the pigs sampled 54,55 % were infected with *A. suum*, 20,45 % with *Trichostrongylus* spp. and 6,8 % with *T. suis*. These findings are important for the pig production industry in Botswana as this type of information is lacking. Among other concerns, internal parasites may cause unthriftness, weakness and diarrhoea, and lead to reduced weight gain and losses in production (Leman, Straw, Glock, Mengeling, Penny & Scholl 1986). In addition, other losses, such as poor carcass grades and quality occur because some parts or even an entire carcass may have to be condemned in abattoirs (Gillespie 1992).

There was no significant difference ($P > 0,05$) in the prevalence of the *A. suum* infection between the mature (68,42 % pigs infected with 1 023 ± 545 eggs per gram [EPG] of faeces per pig) and young (55 % of pigs infected with 1 500 ± 846 EPG of faeces per pig) pigs. The results obtained in this study are consistent with those of Mercy, Channet & Emms (1989) who found that in Australia 68 % of pigs were infected with *A. suum*. The larvae of this parasite species are the cause of milk spots in the livers of pigs (Leman *et al.* 1986). Control of this internal parasite species is, apart from any other consideration, therefore

TABLE 1 The cumulative percentage of pigs infected with internal parasites in the Southeast District of Botswana[a]

Age of pigs	Infection of internal parasite species		
	Ascaris suum (%)	*Trichostrongylus* spp. (%)	*Trichuris suis* (%)
Young	55,00	25,00	15,00
Mature	68,42	5,26	0,00

[a] % = (number of pigs infected in a sub-class/number of pigs in a sub-class) x 100

beneficial in order to reduce condemnation of livers in abattoirs.

Although not significantly different, the extent of the infection of *Trichostrongylus* spp. was lower in the mature (5,26% pigs infected with 20 ± 14 EPG of faeces) than in young (25% with 22 ± 9 EPG of faeces per pig) pigs. *Trichuris suis* infection was also lower in mature (0% of the pigs were infected) than in young (15% of pigs were infected with 9 ± 4 EPG of faeces per pig) pigs. The results obtained for *T. suis* are lower than the 25% infection rate reported by Mercy *et al.* (1989). As *T. suis* is a nematode that infects pigs, wild boars, monkeys and humans (Leman *et al.* 1986) control of this internal parasites has both production losses and human public health concerns.

The infection rates for the three internal parasite species were not significantly different between the sexes; *A. suum* (1 020 ± 883 v. 1 503 ± 522 EPG of faeces per pig), *Trichostrongylus* spp. (24 ± 14 v. 18 ± 8 EPG of faeces per pig) and *T. suis* (11 ± 6 v. 2 ± 4 EPG of faeces per pig) for male and female pigs respectively. This indicates that these parasites have a similar effect on the production for the both sexes. There is need to quantify the effect of these parasites on production in Botswana so that pig farmers are made aware of either the benefits or lack of them in controlling these parasites in their pigs.

External parasites

The only external parasite species identified was *Sarcoptes scabiei* (Table 2). This parasite is probably the most important ectoparasite of swine throughout the world since it causes sarcoptic mange, reduces feed conversion efficiency and is zoonotic (Radostits, Blood & Gray 1995). Its importance tends to be underrated because of a lack of recognition of its presence in pigs. Urquhart, Armour, Duncan, Dunn & Jennings (1987) reported that many pigs harbour in apparent infestations of the mite throughout their lives and that its mode of transmission appears to be between carrier sows and their piglets during the suckling period. Light infestations consist initially of a generalized focal erythema and subsequent encrustation and are accompanied by pruritis (Soulsby (1982). Large numbers of mites are found in the ears of normal sows and the parasites are transmitted to piglets soon after farrowing (Radostits *et al.* 1995). Control of these mites on sows prior to farrowing is, therefore, of economic importance.

Of all pigs sampled 40% were infested with *Sarcoptes scabiei.* This infestation was higher in the young (70%) than in the mature pigs (33,33%). According to Arends (1991) scabies is found throughout the world and is a particular problem in intensively managed production facilities. The results of Cozma, Chirca, Plesoiu & Opris (1997) found that 70% of pigs sampled in Romania were infected with *S. scabiei.* These latter results and those of the present study *lend* support to the statement of Arends (1991) that this parasite does, indeed, have a worldwide distribution. Therefore, pig producers need to take cognisance of this.

TABLE 2 The cumulative proportion of pigs infected with *Sarcoptes scabiei* per age group in the Southeast District of Botswana[a]

Age of pigs	*Sarcoptes scabiei* infection rate (%)
Young	70,00
Mature	33,33

[a] % = (number of pigs infected in a sub-class / number of pigs in a sub-class) x 100

CONCLUSIONS

Ascaris suum was found to be the most common internal parasite of pigs, with similar infection rates in young and adult pigs. Other internal parasites viz, *T. suis* and *Trichostrongylus* spp. were more common in younger pigs than in adults. The infection rates for the three internal parasites were similar for both sexes. *Sarcoptes scabiei* was the only ectoparasite of pigs isolated and it had a higher infestation rate in the younger pigs than in the older pigs. A further study should be carried out to investigate the effect of both ectoparasites and endoparasites on pig production in Botswana as the existing information is not adequate.

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