

Chapter 6

Trematode infection of goats farmed under resource-poor conditions in South Africa

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Abstract

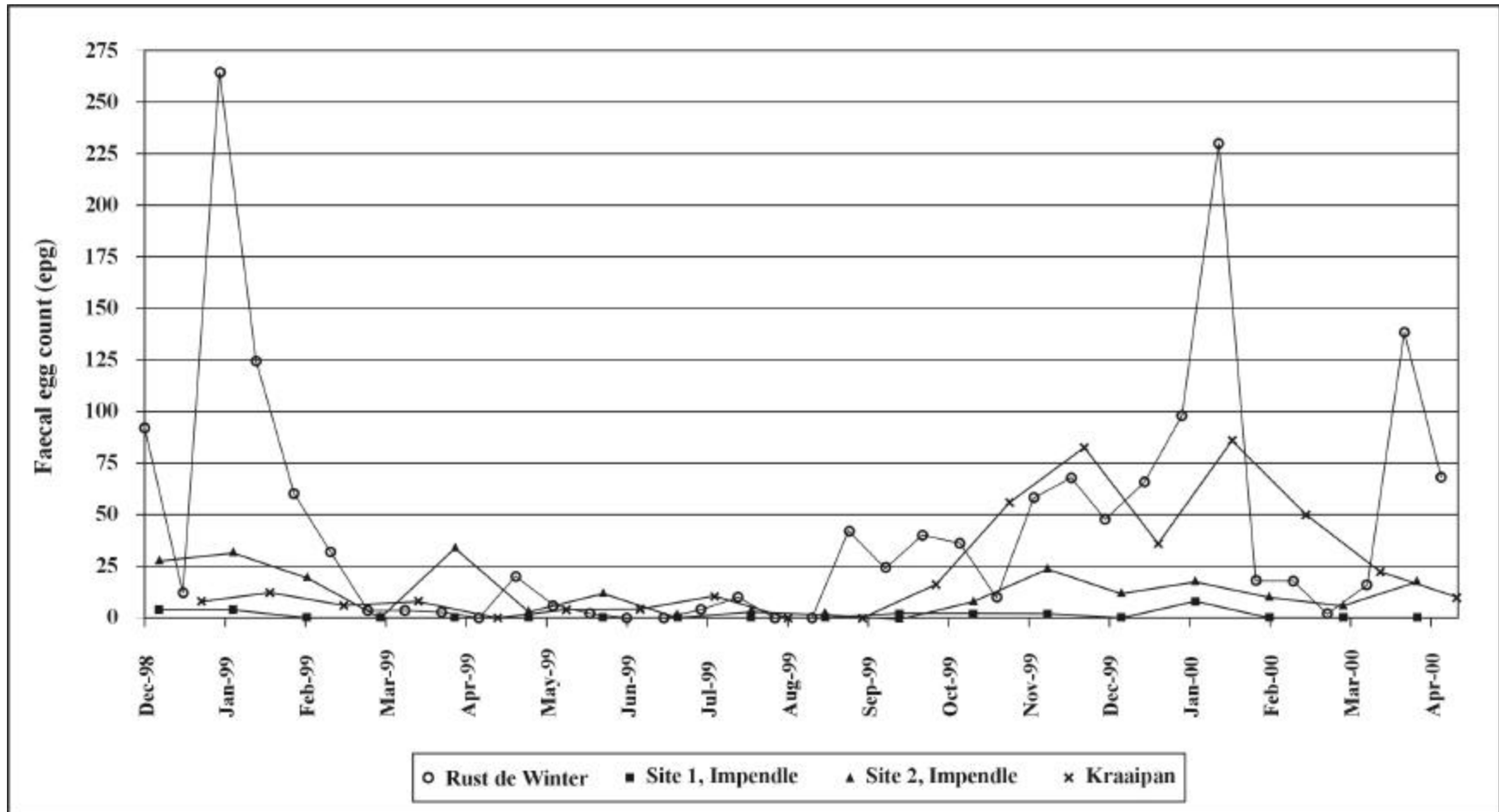
A longitudinal study was conducted of the pooled trematode faecal egg counts (FECs) of samples collected from goats of resource-poor farmers at Rust de Winter, Gauteng Province, Impendle, KwaZulu-Natal Province, and Kraaipan, North-West Province. The amphistome FECs followed a seasonal pattern, with an increase in the counts during the warmer months of the year (September to April). The study seems to indicate a different pattern of infection in goats raised under resource-poor conditions in South Africa from that on commercial farms, where outbreaks of clinical paramphistomosis occur during autumn and winter.

Keywords: Amphistome; Faecal trematode egg counts; *Fasciola* spp.; Small ruminants

As part of a larger study to examine the nematode faecal egg counts (FECs), haematocrits, ocular mucous membrane (eye) colour scores and body condition scores (BCS) of goats owned by resource-poor farmers, a longitudinal study of the trematode FECs was conducted at the same time. Faecal samples were collected from September 1998 to April 2000 at three study sites within the summer rainfall area of South Africa at fortnightly (Rust de Winter, Gauteng Province) or monthly (Sites 1 and 2, Impendle, KwaZulu-Natal Province and Kraaipan, North-West Province) intervals. The results of the nematode FECs, haematocrits, BCS and eye colour scores for the goats are recorded in Chapters 4 and 5 while further details of the trial are recorded in Chapter 3.

Samples were screened for trematode eggs by means of the sedimentation method (Van Wyk et al., 1987) which was modified for pooled samples as follows. Half a gram of faeces (1g for the sheep at Rust de Winter) was weighed off from each of 10 faecal samples (five faecal samples for the sheep at Rust de Winter) randomly selected from those collected at each visit to a site. The faeces were pooled and softened and/or homogenized with an electric mixer (IKA[®] - Labortechnik, Janke and Kunkel, N.T. Laboratory Supplies, Johannesburg) in water. The faeces were then sieved through a 150µm sieve (United wire test sieve, Nigel, South Africa or equivalent) into a 38µm sieve (Labotec test sieve, Johannesburg, South Africa or equivalent), using water sprayed from a nozzle at high pressure. The remaining sediment was washed into a two or three litre glass jar. This was filled with water and allowed to stand for at least 15 minutes. The supernatant was then decanted and the sediment washed by filling up the jar again. This process was repeated approximately three times until the resulting supernatant was clear. Thereafter the sediment was poured into a measuring cylinder, made up to 200ml with water and mixed well by blowing air through the suspension with a pipette. Twenty millilitres of this suspension were examined in a perspex container (70mm x 70mm, E. Krecek, South Africa) under a stereomicroscope for trematode eggs.

Fig. 6.1 : Pooled amphistome faecal egg counts for goats at Rust de Winter, Sites 1 and 2, Impendle, and Kraaipan



The number of eggs per gram of faeces was calculated as follows :

$$\begin{aligned} \text{FEC (in epg)} &= \frac{\text{Number of eggs present}}{\text{Mass of faeces}} \\ &= \frac{\text{Number of eggs counted} \times 10}{10 \times \frac{1}{2}} \\ &= \text{Number of eggs counted} \times 2 \end{aligned}$$

The results of these analyses for the three study sites are recorded in Fig 6.1. The pooled amphistome FECs followed a seasonal pattern at all three study sites, with an increase in the counts during the warmer months of the year (September to April). This is especially evident for the goats at Rust de Winter. In contrast, the amphistome FECs for the goats at Impendle did not rise higher than 8 eggs per gram of faeces (epg) for Site 1 and 34 epg for Site 2. The infection levels at Kraaipan were also low during the first summer of the study but were higher from October 1999 to March 2000.

Fasciola eggs were recorded at levels of 2 and 4 epg in the goats at Rust de Winter and Site 2, Impendle, in August and January 1999, respectively. All other samples examined were negative for *Fasciola* eggs.

Reinecke (1983) reports that cattle and sheep on commercial farms are grazed on higher lying fallow lands in the summer-rainfall period. During this time, conditions on the lands are suitable for the survival of the intermediate snail hosts and they become heavily infected with *Calicophoron* (*Paramphistomum*) eggs. Prior to the winter, however, the snails migrate to areas around dams and marshes where they contaminate the surrounding vegetation with metacercariae. In the late summer, cattle and sheep are moved to the lower lying marshy areas to allow the fallow lands to be planted with wheat. Conditions on the pasture dry out and the animals seek out the better grazing surrounding the wetlands and become heavily infected with *Calicophoron* spp. Outbreaks of clinical paramphistomosis then occur in the autumn and winter.

Given that adult flukes start to pass eggs 69 days after goats have been infected with metacercariae (Horak, 1971), the animals in the present study were probably infected from July to February. Since it is the immature stages that are pathogenic (Horak and Clark, 1963), outbreaks of clinical amphistomosis may occur two to four weeks after infection (Horak, 1971), which in the present study would then have occurred during the late winter, spring and into summer. No signs of a copious, watery, foetid diarrhoea characteristic of amphistomosis (Horak and Clark, 1963) were noted in any of the study animals, however.

The present study seems to indicate a different pattern of infection in goats raised under resource-poor conditions in South Africa from that on commercial farms. Management practices differ markedly between the two farming systems, one difference being that the goats in the resource-poor areas have access to the same grazing throughout the year. This may allow for a more natural cycle of infection to develop in the resource-poor set-up than on the commercial farms where, as discussed above, during autumn and winter animals may be forced to graze camps in which water sources occur which are heavily infested with snails shedding metacercariae.

The low counts and incidence indicate that *Fasciola* spp. was not an important parasite in the animals in this study.