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RESEARCH NOTE

BOVINE PARAFILARIOSIS IN SOUTHERN AFRICA: A PRELIMINARY REPORT*

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ABSTRACT

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A total of 32 042 cattle, slaughtered at the Pretoria, Johannesburg and Durban abattoirs, was examined for parafilariosis and as many animals as possible were traced to the farms from which they originated. The disease is most prevalent in the Bushveld areas of the northern Transvaal. The most important factors limiting its distribution are the annual rainfall and the duration of the frost period. Mention is made of some aspects of the economic loss involved. The effect of routine anthelmintic treatment and dipping on the prevalence of the parasite is briefly discussed.

Résumé

NOTE PRELIMINAIRE SUR LA PARAFILARIOSE BOVINE EN AFRIQUE AUSTRALE

On a recherché la parafilariose chez 32 042 *têtes de bétail ayant passé par les abattoirs de Pretoria, Johannesburg et Durban et dans la mesure du possible on a retrouvé les fermes d'où provenaient ces animaux. C'est dans les zones de "Bushveld" du Nord-Transvaal que la maladie est la plus répandue. Les principaux facteurs limitant sa distribution sont la pluviométrie et la durée des périodes de gel. On entionne certains aspects des pertes que subit l'économie et l'on discute brièvement les effets du traitement antihelminthique de routine et du dipping sur la fréquence du parasite.*

This report deals briefly with the results of an extensive abattoir-based survey of various aspects of parafilariosis, and includes the prevalence, distribution economic implications and certain ecological features of the disease. The results will be reported at length at a later date.

All the cattle slaughtered at the Pretoria abattoir during 1 week in each month from September 1975–September 1976 were examined for parafilariosis. Cattle were also examined for a week in November 1976 at the Johannesburg and for a week in December 1976 at the Durban abattoirs. Wherever possible, the cattle were traced to the farms from which they originated. The data so obtained were analysed to determine the prevalence of the parasite in the different provinces and in the various vegetational zones, the climatic and topographic factors that limit its distribution, the economic loss due to its presence and the effect of routine anthelmintic treatment and dipping on its occurrence.

Prevalence and distribution

Parafilariosis is most prevalent in the northern Transvaal, the northern Cape Province and the south-western Transvaal where 35,9%, 13,5% and 12,2% respectively of the slaughtered cattle are affected (Fig. 1). It occurs to a lesser extent in Natal (6,2%), western Orange Free State (1,9%), eastern Orange Free State (1,8%) and South West Africa (0,7%).

In the northern Transvaal the most seriously affected areas are Sourish Mixed Bushveld, Sour Bushveld, Mixed Bushveld, Thornveld and Arid Sweet Bushveld where 47,0%, 41,9%, 40,3%, 33,0% and 31,6% respectively of the animals are infested. It is less prevalent in Mopani Veld (11,3%) and on the Pietersburg Plateau (14,3%), but there is a dramatic reduction to 2,5% in Bankenveld (between Pretoria and Johannesburg), and to 2% in True Grassveld areas. The disease is also common in Valley Bushveld areas, indicating that it probably extends along the major river valleys of the eastern coast as far south as Port Elizabeth.

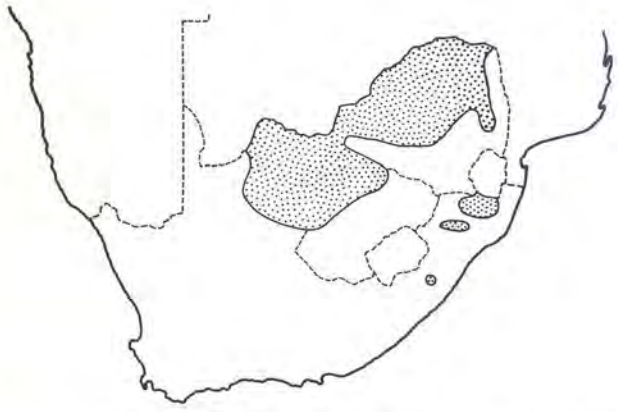

FIG. 1 Confirmed distribution of parafilariosis in South Africa

Influence of climatic and topographic factors

The critical factors limiting its distribution are annual rainfall and the length of time from the first to the last frosts (frost period) which, *inter alia*, are often associated with altitude and mean annual temperature.

Infestation was not found where the rainfall was less than 300 mm: 17,4% of the animals were affected in the 300–400 mm zone and 34,3% in the 400–600 mm zone, decreasing to 9,6% at 800–1 000 mm and 0% at more than 1 000 mm. Where the frost period was less than 120 days, the incidence was 30,5%, but it dropped dramatically to 1,6% when the frost period was more than 120 days. The effect of altitude was equally marked: 34,0% of the cattle were affected at altitudes lower than 1 200 m, 19,9% at 1 200–1 500 m, and 2,8% at more than 1 500 m. In areas with a mean annual temperature below 17,5°C, the incidence was 7,1%, but in warmer areas it was 32,4%. Below 15°C no infestations were detected and above 22,5°C they declined in frequency.

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Optimum conditions for the occurrence of the disease are an annual rainfall of 400–700 mm, a frost period of less than 120 days, a mean annual temperature of 17,5–22,5°C and an altitude of 800–1 200 m.

Influence of age

In Bushveld areas the incidence of parafilariosis increased significantly in animals older than approximately 2 years, but after approximately 4 years of age there was a significant decrease in incidence.

Seasonal activity

Worms were recovered from carcasses throughout the year but the carcass lesions showed a marked increase in severity from August–January. Maximum lesion severity, therefore, corresponds approximately with the increase in bleeding points recorded by Viljoen (1976), which suggests that the production of the lesion may be associated with the reproductive activity of the worm.

Economic loss

The infestation rates for the various carcass grades and the percentage of affected animals down-graded in each case respectively were: Super (13,3%; 12,4%), Prime (28,1%; 12,9%), 1 (31,8%; 10,8%), 2 (35,9%; 3,6%), 3 (37,6%; 0,2%). The percentage of affected animals which were trimmed as a result of the disease at Pretoria abattoir, with subsequent compensation to the producer, were: Super 9,7%; Prime, 14,2%; 1, 16,2%; 2, 15,9%; 3, 14,7%; 4, 11,2%.

Parafilariosis was responsible for 33% of all whole-carcass condemnations at the Pretoria abattoir during the survey.

Not including any losses due to down-gradings, trimmings, or condemnations, the mean price difference between affected and non-affected carcasses at Pretoria abattoir was, for Super Grade, (0,89 cents/kg), for Prime (0,72 cents/kg), for Grade 1 (0,93 cents/kg), and for Grade 2 (1,20 cents/kg).

Influence of routine anthelmintic treatment and dipping

Infestation rates in animals from the northern Transvaal routinely treated with thiabendazole and nitroxynil were significantly lower than in those treated with levamisole and trichlorphon. Viljoen (1976) found levamisole effective at high dosage rates (15 mg/kg×2), but at the low dosage rates routinely used by farmers in this survey this activity was not confirmed. Fenbendazole, another drug effective at high dosage rates (Viljoen, 1976), was not used extensively enough to be included in our statistical analyses, but animals routinely treated with thiabendazole had a lower disease prevalence than those treated with the other drugs, except nitroxynil. Benzimidazoles may therefore be useful in the treatment of parafilariosis, but they are costly at the very high dosage rates employed by Viljoen and, used routinely at the recommended dosage rates, their effect is unsatisfactory. Viljoen & Boomker (1977) reported that high doses of nitroxynil can dramatically reduce lesions but that the therapeutic level is unknown. The present findings confirm the activity of this drug, but at the routine dosage rate employed (10 mg/kg) the effect was not therapeutically satisfactory.

In the northern Transvaal we found that cattle dipped with chlorinated hydrocarbons have a significantly lower incidence of parafilariosis than those dipped with organophosphates and carbamates. This evidence suggests that a possible contributory factor to the increase in the importance of parafilariosis in recent years may be the removal of the chlorinated hydrocarbon DDT from the market in the early 1970's.

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