

# Incidence and control of fascioliasis around Niono, central Mali

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*(Original French title: 'Incidence de la fasciolose chez les ruminants du sous-système agropastoral associé à la riziculture irriguée dans la zone de Niono'.)*

*(Accepted for publication in January 1988)*

## SUMMARY

STUDIES OF *farmers' cattle, sheep and goat herds and visits to the Niono abattoir have confirmed that fascioliasis is a serious problem in the rice subsystem of central Mali. Sheep are most susceptible to the disease, especially its acute form, and goats least. Cattle often suffer from chronic fascioliasis which makes them less resistant to other liver infections. Acute fascioliasis in sheep can be controlled by oral administration of rafoxanide.*

## INTRODUCTION

Fascioliasis is a parasitic disease in ruminants that can cause major economic losses. In Africa, fascioliasis is a serious problem in the humid and subhumid zones (Daynes, 1969; Ogunrinade and Ogunrinade, 1980). In the arid and semi-arid zones, where climatic conditions are less favourable for liver flukes, fascioliasis incidence has until recently been comparatively low. However, the increasing number of dams and irrigation canals built to boost energy and food production has also increased the number of potential snail habitats, and with them the danger of liver fluke infestation.

Hammond (1973) and Graber (1976) reported that sheep are very susceptible to acute fascioliasis and that its periodic outbreaks cause high economic losses. Once infected with flukes, goats are also very susceptible to the disease. In cattle, acute fascioliasis often remains undetected and develops into chronic fascioliasis.

This report is based on a survey conducted around Niono, central Mali, to determine fascioliasis incidence in domestic ruminants and ways of controlling the disease.

## THE STUDY AREA

The study area included 6 villages located within 30 km of Niono, central Mali. All the villages surveyed are on land administered by the Office du Niger, and their inhabitants are agropastoralists engaged in irrigated rice production (Wilson et al, 1983).

The farmers manage their livestock under two different production systems: small ruminants are left to range free near the household while cattle are moved to wet-season pastures during July to October. Rice fields are grazed during the dry season (December–June). Veterinary care is generally limited to annual vaccination of cattle against rinderpest and contagious bovine pleuropneumonia.

## MATERIALS AND METHODS

The study involved 500 head of cattle, 500 sheep and 500 goats. The animals were identified with ear tags. Data were collected on herd morbidity and mortality during both the dry and wet seasons. Faecal samples were examined using the simple sedimentation method. Monitoring of village herds was supplemented with visits to the Niono abattoir to determine what proportion of the slaughtered animals had ruptured livers.

A preventive programme based on rafoxanide (3'-chloro-4'[p-chlorophenoxy]-3, 5-diiodo salicyl anilide) was introduced in two villages to investigate its effectiveness in controlling fascioliasis in sheep and cattle. The fasciolicide was administered in two doses. Both cattle and sheep received one dose before they started grazing the harvested rice fields; the other dose was given to sheep 3 months later and to cattle 6 months later.

## RESULTS

### Faecal examination

Liver flukes were found in the faecal samples examined. Among species, goats had the lowest infestation rate and sheep the highest (Table 1). For all species, the rate of infestation was higher in the dry season than in the wet season. The specific infestation index (SII), calculated to characterise the degree of infestation (Vassiliades, 1970), was between 1 and 5 or between 20 and 100 eggs per gram of faeces.

**Table 1.** Liver fluke infestation rate and specific infestation index (SII) for cattle, sheep and goats, Niono, 1983.

Animal species	Dry season			Rainy season		
	Number of animals	Percent positive	SII	Number of animals	Percent positive	SII
Cattle	80	18.0	2.0	55	10.9	1.3
Sheep	27	22.2	2.5	55	10.0	5.0
Goats	80	6.7	1.0	65	3.1	1.0

### Parasitological examination

Animals slaughtered at the Niono abattoir in June and September 1983 were infested mainly with *Fasciola gigantica*. During both visits, infestation rate was highest among cattle (Table 2). In June, more sheep were infested with flukes than goats, but in September, the infestation rate in goats was higher than in sheep. Cattle had the highest proportion of ruptured livers during both visits. In June, the proportion of cattle with ruptured livers was slightly higher than that of sheep, while in September, ruptured livers were found only in cattle.

**Table 2.** Proportions of animals infested with liver flukes and having ruptured livers, Niono abattoir, 1983.

Survey date	Species	Number of animals	Percentage infested	Percentage with ruptured livers
June 1983	Cattle	23	52.2	26.1
	Sheep	30	25.0	25.0
	Goats	105	5.7	1.9
September 1983	Cattle	25	64.0	18.8
	Sheep	2	0.0	0.0
	Goats	19	15.8	0.0

Losses caused by acute fascioliasis were investigated in three localities. Table 3 shows that about one third of sheep suffering from acute fascioliasis succumbed to the disease, while goat mortality was relatively low, only about 5%. Cattle suffered from chronic fascioliasis which was usually detected during autopsy.

**Table 3.** *Mortality in small ruminants due to acute fascioliasis, central Mali, 1983/84.*

Locality	Survey period	Species	Number of sick animals	Mortality rate (%)
B10	May–June 1983	Sheep	69	30.4
Niono	April 1984	Sheep	30	33.3
N'Tila	April–May 1984	Sheep	45	31.1
		Goats	62	4.8

## Fascioliasis control

Treating animals with rafoxanide before they started grazing rice stubble helped reduce the contamination of the fields with liver flukes excreted in the faeces. When sheep were given a second dose 3 months later, the incidence of acute fascioliasis was reduced. The programme also proved effective in combating chronic fascioliasis in cattle which received the second treatment within 6 months of the first.

## DISCUSSION

The low infestation rates found would seem to belie the gravity of the fascioliasis problem in the study area, but it must be noted that these rates include egg counts in samples from very young animals which are least exposed to liver flukes. The examination of livers for ruptures caused by flukes gives a more realistic picture: fascioliasis is a serious problem in cattle and sheep but goats are considerably less affected because they spend little time grazing rice straw (about 5% of the annual feeding time, according to Dicko and Sangare, 1984).

The preventive programme tested is a suitable means of controlling fascioliasis incidence in sheep and cattle in the rice subsystem of central Mali. Introducing a similar programme for goats, which are browsers rather than grazers and, consequently, are less prone to the disease than sheep and cattle, would not be economic.

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