EPIDEMIOLOGY AND DIAGNOSIS OF SARCOCYSTOSIS

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Abstract. The studies included a total of 788 swine, of which 395 animals were raised on state farms and 393 on privately owned farms. Using artificial digestion (by trypsin) of diaphragm muscles, cystozoites were detected in 193 swine; 24.49% out of 788 animals examined. Among the 395 swine raised on state farms, the presence of cystozoites was demonstrated in 63 (15.95%) of the animals, while in 393 swine from privately-owned farms, cystozoites were found in 130 (33.07%) of those examined. By histological methods cystozoites were detected in 43 swine (18.14%) of the tested animals.

INTRODUCTION

The prevalence of sarcocystosis in animals in Yugoslavia has been poorly studied. Data are scarce on infection of different kinds of animals as well as on the degree of infection (Bartulic, 1968; Wikerhauser, 1981). In the Republic of Serbia research work of this kind has not been carried out and there are no data on the presence of sarcocysts in animals.

Due to the potential hazard to human health and the possibilities for transmission by consumption of infected meat, the following research study was undertaken (a) to examine samples of striated muscle for the presence of sarcocystosis in hogs, bred on state and privately-owned farms; and (b) to compare the diagnostic efficiency for detection of sarcocysts by trypsin digestion and by histological methods.

MATERIAL AND METHODS

The prevalence of sarcocystosis has been investigated in 788 hogs of both sexes, approximately 6 months of age, weighing from 95 to 110 kg, reared on either state and privately-owned farms. The swine originated from eight regions of the Republic of Serbia. Samples from *Crura diaphragmatis* were taken on the slaughter lines; a part of *Crura diaphragmatis* (2×2×2 cm) was frozen in liquid nitrogen and used for histological examination.

To examine for the presence of cystozoites, 10 g of diaphragm was digested in 50 ml of 0.25% trypsin solution (Difco 1:250) in a salt phosphate buffer, pH 7.4.

Only samples from *Crura diaphragmatis* positive for cystozoites by the digestion method were checked histologically. Sections were stained with hematoxylin-eosin.

RESULTS AND DISCUSSION

The presence of sarcocysts in samples of swine *Crura diaphragmatis* reared on state farms and privately-owned farms by the trypsin digestion method is shown in Table 1 and Fig 1.

Differences were observed in the distribution of infection between swine reared on privately and state-owned farms. Only 15.95% of state reared swine were infected in comparison to 33.07% from privately reared swine.

For the purpose of assessing the efficiency of a direct method for the detection of sarcocystosis in pork, the trypsin digestion results were compared with the histological method in naturally infected hogs. The results of these comparisons are presented in Table 2 and Fig 2. It is evident that the trypsin digestion method is significantly

Table 1

Detection of sarcocystosis in pigs by the trypsin digestion method in the territory of Serbia.

	No. of examined pigs	Recovery			
		positive		negative	
		No.	%	No.	%
State farms	395	63	15.95	332	84.05
Private farms	393	130	33.07	263	66.92
Total	788	193	24.49	595	75.50

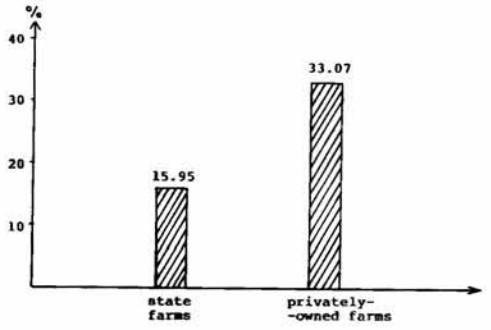

Fig 1–Detection of sarcocystosis in pigs by the trypsin digestion method in the territory of Serbia.

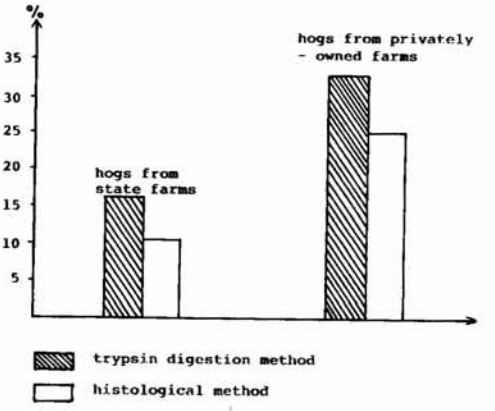

Fig 2–Comparison of the efficiency of the trypsin digestion method and the histological method for diagnosis of sarcocystosis in pigs.

Table 2

Comparison of the efficiency of the trypsin digestion method and the histological method for diagnosis of sarcocystosis in pigs.

	No. of animals examined	Positive findings by			
		trypsin digestion method		histological method	
		No.	%	No.	%
State farms	395	63	15.95	43	10.88
Private farms	393	130	33.07	100	25.45
Total	788	193	24.49	143	18.14

more sensitive than the histological method. This is documented by the finding that of 193 trypsin-digested-positive swine (24.49% of the total), only 143 (18.14%) were positive by the histological technic.

The results represent the first attempt in Serbia to survey for sarcocystosis in pork. The importance of these results is that pork meat is widely consumed by our population and, therefore, the risk of human infection may be high.

The percentage of infected hogs in Yugoslavia is higher than the rates reported for Denmark, Germany and Holland (Greve, 1973; Heydorn, 1978; Boch, 1981). However, some of these differences are probably due to differences in the methods used.

The difference in the percentage of infected hogs reared on privately-owned and state farms, are interesting; the rate of infected animals is 100% higher on privately-owned farms. In our opinion, the probability of hogs reared on the privately owned farms coming into contact with the sporocysts of *Sarcocystis* is greater because the majority of these hogs are partly or completely fed-out with feed prepared at home. Also, the final hosts of swine sarcocystosis are dog and man. Hogs raised on private farms may have a greater contact rate with sporocysts excreted with the feces of the final host.

The results of our comparative tests on the histological and trypsin digestion methods show that the histological method is far less sensitive. Our results agree with the findings of Erber (1977) who pointed out that the application of the trypsin digestion method, with a centrifugation step, facilitates the analyses a larger sample but also more effectively yields detectable cysts. By this method we are able to examine 10 g of diaphragm muscle, versus a less than 1 g sample by the histological technic.

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