

Survey of *Sarcocystis* Infection in Cattle in East Hokkaido, Japan

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ABSTRACT. The prevalence of *Sarcocystis* infection was examined in older cows and imported cattle slaughtered in East Hokkaido. Samples of myocardial tissues were examined for *Sarcocystis* microscopically. *Sarcocystis* cysts were detected in 15.7% of 83 older cows, 48.4% of 91 imported cattle which were kept in East Hokkaido prior to slaughter and 51.1% of 94 imported cattle slaughtered immediately after quarantine check. Based on the morphology of the cyst wall and the establishment of infection in experimentally inoculated dog, the *Sarcocystis* species was identified as *Sarcocystis cruzi*.—**KEY WORDS:** cattle, prevalence, *Sarcocystis*.

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Etiologic agents of sarcocystosis in cattle include *Sarcocystis cruzi* (syn. *Sarcocystis bovicanis*) transmitted by canids, *Sarcocystis hirsuta* (syn. *Sarcocystis bovifelis*) transmitted by felines, and *Sarcocystis hominis* (syn. *Sarcocystis bovihominis*) transmitted by man. High incidence of bovine *Sarcocystis* infection has been reported in many countries [1–3, 5]. In Japan, Sekikawa *et al.* [7] reported the prevalence of *Sarcocystis* in cattle in Niigata Prefecture, and Inoue *et al.* [4] had documented the detection of *S. hirsuta* in Aichi Prefecture.

In Japan, beef is derived mainly from 1 to 3 years old cattle and from older cows after breeding and suckling. Presently, due to a higher demand for processed meat products, many cattle imported from other countries are used up by livestock companies. Vealers and cattle are housed from birth until slaughter, thus they have less chances of contacting the infection. Older cows, on the other hand, which are kept for breeding and suckling, would have more chances of exposure to contaminated materials.

In the present study, we conducted a survey of the prevalence of *Sarcocystis* infection in older cows and imported cattle kept and slaughtered in East Hokkaido.

Samples of myocardial tissue were obtained from April to July, 1993 from 83 older cows and 91 vealers and cattle which were imported at an age of 6 months and were kept in East Hokkaido until slaughter. In addition, 94 cattle, mainly from 2 to 3 years old imported from Australia which were sacrificed immediately after quarantine check were examined during the same period. Nine to 15 pieces of muscle tissues (approximately 0.1 g/piece) were excised from each animal, teased in saline and examined microscopically. The identification of *Sarcocystis spp.* was based on morphological features, specifically on the structural dissimilarity of cyst wall. To confirm the definitive host of the *Sarcocystis* examined, one adult, male beagle dog was fed with approximately 20 g of muscle tissue in which cysts were found, followed by a daily fecal examination using 33% ZnSO₄ floatation method.

Sarcocystis cysts were detected in 13 out of 83 older cows, with a prevalence rate of 15.7%. Imported cattle showed significantly higher prevalence rates of 48.4% and 51.1%, than those reared in Japan and those slaughtered immediately after quarantine check, respectively.

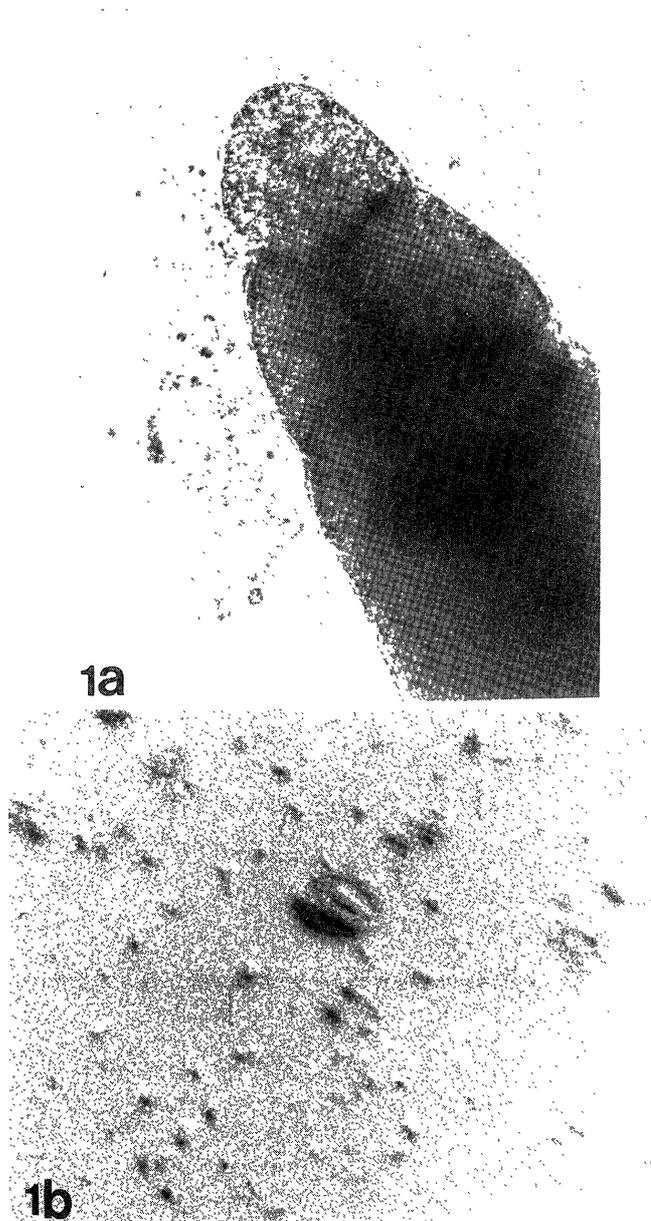


Fig. 1. *Sarcocystis bovicanis* cyst and sporocysts. 1a: Cyst in cattle myocardial tissue. Note thin cyst wall. $\times 400$. 1b: Sporocyst with 4 sporozoites recovered from feces of experimental dog. $\times 400$.

As shown in Fig. 1a, the cyst has the cyst wall less than 1 μm and is morphologically indistinguishable from *S. cruzi*. Thick-walled cysts, indicative of either *S. hirsuta* or *S. hominis* were not detected. Sporocysts containing four sporozoites were detected in the dog's feces on the 12th and 18th day post-exposure (Fig. 1b).

The high prevalence rate of *S. cruzi* infection among imported cattle observed in the present study is consistent with those reported by Sekikawa *et al.* [7] and Inoue *et al.* [4]. Prevalence of *Sarcocystis* infection in older cows, however, is lower compared to those documented in other prefectures of Japan [4, 7].

Savini *et al.* [6] consider both environmental conditions of cattle and management as major factors that influence the prevalence of bovine *Sarcocystis* in Western Australia. In Hokkaido, the climate is typically of lower relative humidity during the summer season and temperature drops below 0°C for days during the winter season. Thus,

chances of sustaining infective *Sarcocystis* oocysts in pasture could have influenced in part, by the lower rate of *Sarcocystis* infection in older cows in Hokkaido, as noted in the present study.

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