

FIRST RECORD OF GIARDIA SP. IN CALVES IN CZECHOSLOVAKIA

Fig. 1. *Giardia* sp. from calf faeces (trophozoite on the left, cyst on the right) in phase contrast microscope. ($\times 200$.)

A complex of many factors affect the health condition of newborn calves in large-scale breeding farms. In most cases this effect is negative. As it follows from literary data, particularly the diarrheal diseases are the cause of death of 5—20-day-old calves. Maximum attention has been paid to these diseases also in Czechoslovakia. In spite of various preventive measures and treatments, the direct and indirect losses due to diarrheas in calves are still rather high.

Many causative agents of diarrhea are known at the present time. They act either individually or, more frequently, in mutual interactions. In addition to pathogenic bacteria and viruses, also parasites, particularly protozoans of the genus *Cryptosporidium*, may cause diarrhea in some young animals.

The occurrence of *Giardia* sp. (Fig. 1) was registered during the studies on cryptosporidial infections in calves. This protozoan belongs to the order Diplomonadina Wenyon, 1926 and the structure and morphology of its trophozoites and cysts resembled *Giardia* of the group *Giardia intestinalis*. The body structure of trophozoites and arrangement of its individual cellular organelles resembled the description and drawings of *Giardia bovis* published by Supperer (Wiener Tierärztl. Monatschr. 39: 26—29, 1952), as well as drawings of *G. intesti-*

nalis (in Jirovec O. et al., Parasitology for physicians, Avicenum, p. 245, 1977 — in Czech).

A total of 100 cysts and the same number of trophozoites of *Giardia* were recovered from fresh faeces of a spontaneously infected calf, diluted with saline and measured. The cysts were oval and measured $12.8\text{--}14.4 \times 8.0\text{--}9.6\text{ }\mu\text{m}$ (mean $13.3 \times 8.2\text{ }\mu\text{m}$). The trophozoites were pear-shaped and measured $12.8\text{--}16.0 \times 8.0\text{--}11.2\text{ }\mu\text{m}$ (mean $14.4 \times 9.2\text{ }\mu\text{m}$).

During coprological examinations (using Breza's method) of faeces of 12 calves from a large-scale calf-breeding farm, which suffered from diarrhea for 3 days, cysts of *Giardia* were detected in two 50-day-old calves. A mixed infection of *Giardia* sp., *Eimeria ellipsoidalis* and *Strongyloides papillosus* was demonstrated in one of the calves.

Another case of *Giardia* infection was recorded in a calf which was infected with cryptosporidia at the age of 12—33 days, i.e., for 21 days. The faeces of this calf were yellow-brown, mostly of pulpy and foamy consistence. Another 21-day-old calf without *Giardia* infection was transferred to the box with the infected calf. *Giardia* cysts were then detected in its faeces after 8 days and for further 8 days. Diarrhea occurred on days 4 and 5 after detection of cysts in the faeces.

During orientation examinations of 39 calves



from two large-scale calf-breeding farms *Giardia* sp. was detected in 8 animals, i.e. in 20.5 %.

Giardia bovis cysts were found for the first time in cattle by Fantham in 1921 (S. African J. Sci. 18: 164, 1921). Galli-Valerio (Schweiz.med. Wschr. 67: 1181—1182, 1937) succeeded in treating *G. lamblia* infection in calves with atabrin. Supperer (1952) reported on bovine lamblia and described the biology of *Giardia bovis* recovered from calves. Desphande and Shastri (Trop.Anim.Hlth.Prod. 13: 34, 1981) from India found that more than 51 % of 1—6-month-old calves (from the total number of 157 calves examined) expelled cysts of *Giardia*. Since the authors did not detect any other intestinal pathogen in 10 of the calves

Institute of Parasitology,
Czechoslovak Academy of Sciences,
České Budějovice

suffering from diarrhea, they assumed that *Giardia* was the single causative agent in these cases.

Willson (Can.Vet.J. 23: 83, 1983) recorded *Giardia* in two calves in Canada. The author found trophozoites and cysts of this protozoan in the faeces of a 13-day-old calf for 31 days. He managed to transfer *Giardia* infection from the spontaneously infected calf to another calf, which then expelled cysts of the protozoan for 11 days. Besides the abnormally mucoid faeces, no clinical symptoms were observed in the calves. Since the two calves were rapidly treated with atabrine hydrochloride, the author assumes that *Giardia* are pathogenic for calves. Nesvadba et al. (Proc. XII World Congr. Dis. Cattle: 234—241, 1982) reported that giardiasis in cattle in Switzerland occurs rather in individual animals than in herds. In the authors' opinion, calves weakened by other diseases are more sensitive to giardiasis. They consider chronic diarrhea to be the most common symptom of this disease. *Giardia* are resistant to drugs used for diarrhea treatment, but they are sensitive to nitroimidazole drugs, as Ipropan (Hoffman-La Roche).

The results of the above authors, as well as our own records of *Giardia* cysts in calves suffering from diarrhea, indicate that another parasite may participate in the complex of enteropathogens causing this serious disease. Further studies of *Giardia* sp. in calves should be directed at an exact specific determination of the parasites and verify their host specificity on the basis of experimental infections. The detection of *Giardia* cysts in our material, together with oocysts of coccidia of the genus *Eimeria* and nematode of the gastrointestinal tract, *Strongyloides papillosus*, stress the significance of the studies on parasitocenosis and mutual associations in order to evaluate the share of individual agents in the diseases of economically important animals bred under the present new conditions of large-scale breeding farms.

I. PAVLÁSEK