Medication of Feedlot Calves Infected with *Eimeria* spp. by a Combination of Sulfamonomethoxine and Ormetoprim

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**ABSTRACT.** Feedlot calves naturally infected with *Eimeria* spp. were medicated by a combination of sulfamonomethoxine and ormetoprim (Ektectin). Calves, less than one year old and positive for coccidiosis, were administered with Ektectin (5, 10 and 20 ml/100 kg of body weight/day) and Daimeton (100% sulfamonomethoxine: 5 g/100 kg of body weight/day) for five days. No diarrhea were found on and after 3 days of medication in all the groups, and no oocysts were detected on and after day 5, 2, 1 or 3 from calves of the respective medicated groups. In samples from a group of calves administered with lowest dose of Ektectin, eimerian oocysts of 4 species were detected on day 0, and additionally 3 species (totally 7 species) were found on day 3 of medication. — **KEY WORDS:** bovine coccidiosis, ormetoprim, sulfamonomethoxine.


Coccidiosis is the third most prevalent health problem among parasitic diseases in cattle and results in economic loss [7, 14]. Young calves are more susceptible than older ones. The clinical signs are poor performance and watery bloody diarrhea with high mortality. By injuring the absorptive surface of the digestive tract, lower rates of feed efficiency and loss of body weight occur.

Several coccidiostats, e.g., amprolium [9], monensin [8] and sulfonamides [3, 4], were reported to be chemotherapeutically effective to bovine coccidiosis in the field. Sulfonamides and pyrimidine groups have been widely used for the prevention and treatment of coccidiosis in poultry [1, 5]. The anticoxidial activity of sulfonamides is known to be increased when they were used in combination with some pyrimidine groups in poultry [10, 12–13]. Sulfonamides were used for the treatment of clinical infection of bovine coccidiosis in the field [4]; however, only a few data was available concerning the efficacy of the combination of sulfonamides and pyrimidine groups like ormetoprim on bovine coccidiosis.

In the present study, we tried the medication of a combination of sulfamonomethoxine and ormetoprim (Ektectin) for the treatment of feedlot calves infected with *Eimeria* spp.

Twenty four Japanese Black calves naturally infected with *Eimeria* spp., less than one year old, in Kawatabi farm of Tohoku University were used. They were fed on haylage, concentrated feed *ad libitum* in the feedlot. Coccidial infection was diagnosed by the fecal examination. As a combination drug, Ektectin (trade name of Daichi Pharmaceutical Co., Ltd., Tokyo), of which 100 ml solution contained 7.5 g sulfamonomethoxine and 2.5 g ormetoprim, and as a single sulfonamide drug, Daimeton (trade name of Daichi Pharmaceutical Co., Ltd., Tokyo: 100% sulfamonomethoxine) were used. Daimeton is a only drug which were registered as orally administrable therapeutic drug for bovine coccidiosis in Japan (recommendation dose: 3–6 g/100 kg of body weight/day). Calves were divided into four groups, and medicated with 5, 10 and 20 ml Ektectin/100 kg of body weight/day (Group A, B and C, respectively) and 5 g Daimeton/100 kg of body weight/day (Group D) for 5 successive days. They were orally administered with drugs through the catheter once a day. Since we aimed at the treatment of calves, non-medicated control group was not considered in this experiment. Fecal samples were rectally collected every day, and visually checked for their consistency and blood spot. Coccidial oocysts were examined by the flotation method with sodium chloride saturated solution. Oocysts per gram feces (OPG) were measured by the modified McMaster method with saturated sodium chloride solution [6]. After sporulation in 2.5% (W/V) potassium dichromate solution at room temperature, oocysts were morphologically identified [11].

No fecal samples contained blood or mucus; however almost samples showing oocysts were watery or soft in consistency. On and after the third day of medication, no diarrhea were observed. The results coincide with a study [2] using salinomycin for *Eimeria bovis* infection in calves, in which study oocyst discharge reduced parallel to reduction of the clinical signs, such as poor performance, watery diarrhea.

Although values of OPG were low in all calves in the experiment, OPG reduced in all calves after medication, and no oocysts were detected on day 1, 2, 3 or 5 from calves of Group C, B, D or A, respectively (Fig. 1). The results indicate that both Ektectin and Daimeton are effective for the control of natural infection of bovine coccidiosis in the field. They also showed that daily administration of 10 or 20 ml Ektectin/100 kg of body weight/day may have high efficiency for controlling bovine coccidiosis. In the further study, experimental medication using experimentally infected calves with various drug doses including non-medication control should be performed to clarify the efficacy of these drugs.
Population of eimerian species were surveyed on day 0 and 3 in Group A (lowest dose group of Ektectin). From 81 eimerian oocyst observed on day 0, only 4 species were detected (27 oocysts of *E. bovis*, 27 of *E. zuernii*, 20 of *E. auburnensis* 7 of *E. canadensis*). On the other hand, additionally 3 species, totally 7 species were identified from 21 oocysts observed on day 3 of medication (8 oocysts of *E. bovis*, 3 of *E. zuernii*, 4 of *E. auburnensis*, 1 of *E. canadensis*, 3 of *E. subspherica*, 1 of *E. bukidnonensis*, 1 of *E. ellipsoidalis*). Although numbers of oocysts observed were insufficient, these results show the change of population of *Eimeria* spp. by administration of the drug. It may suggest that there is a variation of sensitivity to Ektectin or sulfamonomethoxine among bovine eimerian species, corresponding with previous reports [8–9]. However, to clarify the anticoccidial efficacy and spectra of these drugs, the experimental infection using definite bovine eimerian species should be performed.

REFERENCES