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Effect of Thiamin Chloride on *Eimeria nieschulzi* Infection of the Rat.*

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It was shown in previous experiments[1, 2] that wheat middlings and wheat bran supplements had the property of creating in the rat host a condition more favorable for the development of the coccidium *Eimeria nieschulzi* than the control ration, or even the control ration supplemented with white wheat flour. In a thorough recheck of the effects of wheat middlings (gray shorts), the following test ration (parts by weight) was used: beet sugar, 71; soy bean oil meal, expeller process, 10; casein, commercial, medium fineness, 10; normal salt mixture (Harris), 4; lard, 3; cod liver oil, 2. When 30 parts of wheat middlings were substituted for some of the sugar, casein, and soy bean oil meal, increased coccidium development, as indicated by counts of oöcysts passed by rats on the 2 rations, continued to be evident. Since, as was previously concluded, it seemed that amount of fiber could be ruled out as the causative factor, an investigation of the effects of extracts of wheat middlings was indicated.

Weighed amounts of wheat middlings were extracted by covering them with an excess of 95% ethyl alcohol and shaking several times daily for 3 days. The alcohol was recovered by filtration, and the process repeated twice. The test ration consisted of the control ration described above with the addition of alcoholic extract equivalent to 4 g of middlings dried onto each 10 g of the ration. This meant that each rat in the test series ate daily the material extracted by alcohol from about 4 g of wheat middlings. Animals were put on the rations when litters had attained a mean weight between 65 g and 85 g. After 10 days on the rations they were inoculated with 2000 sporulated oöcysts of *Eimeria nieschulzi,* and 3 days later with the same dosage. The weight gains recorded in Table I were those made during the first 17 days on the special rations, which included the first 7 days of the infection. The numbers of oöcysts recorded represent those passed during the ensuing period of oöcyst elimination, lasting about 10 days.

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1 Becker, E. R., and Derbyshire, R. C., *Ia. St. Col. J. Sci.*, 1938, **12**, 211.

2 Becker, E. R., and Waters, P. C., *Ibid.*, 1939, **13**, 243.

TABLE I.
Oöcyst Counts and Weight Gains for Rats Receiving Alcoholic Extract of Wheat Middlings and Thiamin Chloride Compared with Controls.

		Test Series			Reference Series		
Group	Supplement	No. rats	Mean wt, gain	Mean millions of oöcysts	No. rats	Mean wt, gain	Mean millions of oöcysts
1	Extract mids	3	55	164	3	37	201
2	" "	3	46	55	3	24	183
3	" "	3	39	78	3	20	156
4	Thiamin chloride	8	21	35	8	16	67
5	" "	3	31	44	3	21	51
6	" "	4	28	61	4	20	120

Table I shows that there was a striking difference in the quantitative character of the infections in the groups of rats on the two rations. Since alcoholic extracts of cereal products usually contain considerable amounts of vitamin B, there was a possibility of it being the factor concerned in limiting the infection. Accordingly, the experiments were repeated with the exception that the test series received 10 micrograms of thiamin chloride per rat as a daily supplement in place of the alcoholic extract of middlings. The table shows that in this case also there was a decided difference in the counts for the two lots. Conversely, the test series made greater weight gains when either alcoholic extract or pure crystals were used as the source of vitamin B.

The experiments indicate that vitamin B_1 (thiamin chloride) exerts a restraining influence on the development of the coccidium *Eimeria nieschulzi* in its rat host.