

Effect of Orally Administered Potassium Iodate on Blood Sugar Response to Thiourea.* (17777)

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The profound influence which goitrogenic drugs may exert on carbohydrate metabolism has recently been demonstrated. DuBois, Holm and Doyle(1) observed a marked hyperglycemia with concurrent depletion of liver glycogen 2½ hours after intraperitoneal injection of alpha-naphthylthiourea (ANTU) in adult rats. Previous administration of large doses of cysteine (1000 mg per kg) afforded protection against lethal doses of the goitrogen. Griesbach, Kennedy and Purves(2) have demonstrated that iodide injection in doses of 1.30 mg every fourth day into rats protected them against thiourea toxicity. Byerrum(3) likewise demonstrated the effectiveness of iodine, either as Lugol's solution or as potassium iodide, in protecting rats against the toxic effects of ANTU.

The purpose of this experiment was to determine the effect of orally administered potassium iodate on the blood sugar response of rats injected intraperitoneally with thiourea.

Experimental. 24 rats of both sexes of the Wistar strain were separated into 2 groups

of 12 each. Rats of Group I (Table I) ranging in weight from 148 to 398 g were bled from the tail and glucose concentration determined by the Folin-Wu micro method, after which thiourea (10 mg/kg) was injected intraperitoneally. A second blood sugar determination was made 2½ hours later.

The 12 rats in Group II (Table II) ranging in weight from 147 to 392 g received 0.2% potassium iodate in their drinking water *ad libitum* for 2 days, after which blood sugar determinations were made as in Group I. Then thiourea was injected intraperitoneally as in Group I (10 mg/kg) and a second blood sugar determination made after 2½ hours as before.

Results. The 12 rats in Group I receiving only thiourea showed an average rise in blood sugar of 91.0 mg per 100 cc 2½ hours following injection. Rats in Group II which had been fed 0.2% KIO₃ when injected with thiourea at the same dosage level as those in Group I showed an average blood sugar increase of only 14.6 mg per 100 cc. Statistically the results are significant, the *t*-value

TABLE I.
Effect of Thiourea on Blood Sugar Level of 12 Non-fasted Rats. Second blood sugar reading (B) was taken 2½ hr after rats received 10 mg/kg thiourea intraperitoneally.

Sex	Wt g	Blood Sugar (A) mg/100 cc	Blood Sugar (B) mg/100 cc	Difference (B-A)
M	379	90	165	75
M	387	90	187	97
M	398	86	165	79
M	358	86	117	31
M	148	83	225	142
F	322	86	165	79
F	372	90	186	96
F	348	79	165	86
F	324	66	140	74
F	317	79	300	221
F	342	109	140	31
F	168	105	186	81
			Avg Blood Sugar Incr.	91

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1. DuBois, K. B., Holm, L. W., and Doyle, W. L., *Proc. Soc. Exp. Biol. and Med.*, 1946, v61, 102.

2. Griesbach, W. E., Kennedy, T. H., and Purves, H. D., *Nature*, 1944, v154, 610.

3. Byerrum, R. U., *Proc. Soc. Exp. Biol. and Med.*, 1946, v62, 328.

TABLE II.
Effect of Thiourea on Blood Sugar Level of 12 Non-fasted Rats Previously Fed KIO_3 . Sugar reading (B) was taken $2\frac{1}{2}$ hr after rats received 10 mg/kg thiourea intraperitoneally.

Sex	Wt g	Blood Sugar (A) mg/100 cc	Blood Sugar (B) mg/100 cc	Difference (B-A)
M	383	63	79	16
M	392	59	86	27
M	366	76	90	14
M	333	90	93	3
M	319	63	97	34
F	285	93	105	12
F	315	105	122	17
F	186	102	97	-5
F	147	69	86	17
M	193	83	97	14
M	201	90	97	7
M	150	73	93	20
			Avg Blood Sugar Incr.	14.7

of 5.16 indicating less than one chance in a thousand of the results being accidental.

Summary. Oral administration of potassium iodate for a 2-day period in drinking

water prevented the hyperglycemia which followed thiourea injection in rats.

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Microbial Synthesis and Multiple Nature of *Lactobacillus bulgaricus* Factor. Possible Role in Chick Nutrition.* (17778)

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Recently Williams, Hoff-Jorgensen and Snell(1) reported that many natural products contained a previously unrecognized factor necessary for the growth of several strains of *Lactobacillus bulgaricus*. An assay method was described in which yeast extract was used as a standard of comparison and given an arbitrary potency of one unit per mg. Application of this assay method to culture filtrates of several microorganisms revealed that the *L. bulgaricus* factor (LBF) was generally synthesized and excreted in part into the medium by organisms which did not require it preformed (Table I). Such

culture filtrates were in some cases appreciably more potent sources of LBF than is yeast extract. The richest source of LBF yet found is the culture filtrate from *Ashbya gossypii* NRRL-1056, which on the dry basis is 3 to 5 times as active as yeast extract. LBF is also produced by *A. gossypii*, although to a lesser extent, in a synthetic medium containing glucose, amino acids, salts and vitamins. Fractionation characteristics of LBF(1) suggested that more than a single active entity might occur naturally. To check this possibility, culture filtrates of *A. gossypii* were chromatographed on paper strips in a manner similar to that described by Winsten and Eigen(2). Water-saturated

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1. Williams, W. L., Hoff-Jorgensen, E., and Snell, E. E., *J. Biol. Chem.*, 1949, v177, 933.

2. Winsten, W. A., and Eigen, E., *Proc. Soc. Exp. Biol. and Med.*, 1948, v67, 513.