she produced more milk and was in an earlier state of lactation.

If the average cow producing 4 liters of milk a day can secrete in the milk 0.5% of a 10 g oral dose of iron per 24 hours, 12.5 mg of iron would be present in each liter—an amount more than adequate for a growing child who consumed a liter of milk a day.

Conclusions. In the 2 cows studied, 1.5% and 2.5% of the radio-iron administered orally was secreted respectively in the milk during a 78-hour period.

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NaCl and Peritoneal Absorption and Renal Excretion of Glucose in Normal and Diabetic Rats.*

George Sayers and James M. Orten.

From the Department of Physiological Chemistry, Wayne University College of Medicine, Detroit.

Sodium chloride appears to influence the glucose tolerance of the diabetic rat[1] and to exert a favorable effect upon certain human diabetics.[2] Its mode of action is interesting from both the practical and the more theoretical aspects of carbohydrate metabolism. It may aid the body in storing[3] and in utilizing more glucose or it may lower the absorption and retention[4] of sugar.

The present study has been made to determine the effect of sodium

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1 Orten, J. M., and Devlin, H. B., *J. Biol. Chem.*, 1940, **136**, 461.

2 McQuarrie, I., Thompson, W. H., and Anderson, J. A., *J. Nutrition*, 1936, **11**, 77.

3 Crabtree, D. G., and Longwell, B. B., Proc. Soc. Exp. Biol. and Med., 1936, **34**, 705.

4 McDanell, L., and Underhill, F. P., *J. Biol. Chem.*, 1917, **29**, 273.

chloride on the peritoneal absorption and urinary loss of glucose in rats administered glucose intraperitoneally under standardized conditions. Normal and hereditary diabetic rats of the "Yale" strain, classified by tolerance studies, and partially pancreatectomized rats were used. After a 16- to 18-hour fast, either glucose alone or a glucose solution containing sodium chloride (see Table I) was injected intraperitoneally; the rats were placed in special metabolism cages and at the end of a 5-hour period the blood sugar was determined by the micro method of Hagedorn and Jensen[5] upon blood obtained from a tail vein. The animals were then lightly anesthetized with nembutal and all residual urine in the bladder was removed by catheterization. In sacrifice experiments, the peritoneal fluid was carefully withdrawn and measured. Hanes' modification[6] of the Hagedorn and Jensen method was used to determine urinary and peritoneal fluid sugar.

The data obtained on individual animals and the group averages are given in Table I. The apparent increase in glucose tolerance brought about by sodium chloride confirms the previous report from this

TABLE I.
Effect of Sodium Chloride on Absorption and Excretion of Intraperitoneally Injected Glucose* During 5-hour Period.

	Normal		Hereditary diabetics		Pancreatectomized	
	Glucose alone	Glucose +NaCl	Glucose alone	Glucose +NaCl	Glucose alone	Glucose +NaCl
Terminal blood sugar, avg (mg%)	134	121	226	122	193	135
Glucose absorbed (%)	80	86	82	84	88	84
	86	75	88	72	75	83
	91	94	82			81
	80					
Avg	84	85	84	78	82	83
Urinary glucose (mg)	3	53	0	81	0	217
	9	291	9	49	25	161
	5	62	4	81	7	179
	2	230	8	49	3	207
	3	172	15	95	18	279
			3	39	13	120
			7			
Avg per 100 g body wt.	1.2	52	2.4	23	4.0	75

*4 cc/100 g body wt. of either an 8.75% glucose alone or an 8.75% glucose + 1.58% NaCl solution.

[5] Hagedorn, H. C., and Jensen, B. N., *Biochem. Z.*, 1923, **135**, 46.

[6] Hanes, C. S., *Biochem. J.*, 1929, **23**, 99.

laboratory.[1] While sodium chloride had no significant effect upon glucose absorption from the peritoneal cavity, it produced a marked glycosuria in all rats. This was especially striking in the pancreatectomized animals.

In preliminary studies, the data of which are not included in the present paper, a similar glycosuria and a normal glucose tolerance resulted when the glucose was given in an 0.85% sodium chloride solution to the normal and diabetic rats. The effects were somewhat less pronounced, however, than were those obtained with the stronger concentration of sodium chloride (Table I).

Some striking differences between the animals given glucose alone and those given added sodium chloride were observed. Bleeding from the tail was extremely difficult in the former group and both the water intake and urine output were practically *nil,* as has been reported by Darrow and co-workers[7] for other species similarly treated. The rats given added sodium chloride, on the other hand, bled normally, drank freely, and excreted relatively large amounts of urine. It appears that the extra water intake of the sodium-chloride-treated rats resulted in the diuresis which in turn was accompanied by the observed increased glycosuria. That sodium chloride has more than a glycosuric action, however, is indicated by preliminary studies which show that despite the high urinary loss of glucose there is an increase in the storage of glycogen in the livers of the sodium chloride-treated rats.

Summary. Sodium chloride added to an intraperitoneally injected glucose solution has no influence upon the absorption of the glucose but does increase glucose excretion by way of the kidney. This increased glycosuria appears to be a factor involved in producing the normal glucose tolerance observed in hereditary diabetic and partially-pancreatectomized rats administered sodium chloride with the glucose.

[7] Darrow, D. C., and Yannet, H., *J. Clin. Invest.*, 1935, **14**, 266.