TABLE I.

	Control	Tetracycline	P
Half-time in days of fast component	.65 ± .17	.61 ± .12	.58
% of dose incorporated in bone	35 ± 7	33 ± 4	.55
Half-time in days of slow component (elimination of Sr-85 from bone)	35 ± 4	22 ± 2	.01
% of dose in whole mouse on 25th day	21 ± 4	16 ± 2	.01
% of dose in femurs on 25th day	1.65 ± .43	1.16 ± .06	.01

Sr-85 was present in any tissue except bone. The Sr-85 content of femurs from each mouse was determined. Comparison of the two group averages (± S.D.) is set forth below. P is the probability of the difference between groups having occurred by chance.

It appears then that under the conditions of this experiment parenterally administered tetracycline accelerates elimination of strontium from bones, while not significantly affecting the amount deposited in bones. Dosage and time dependence of this effect is being further studied.

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Glucose Uptake by Epididymal Fat Pads from Rats Fed Glucose, Lactose or a Glucose-Galactose Mixture. (26685)

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The carcass fat content of growing and mature rats fed glucose is about 40% greater than that of those fed lactose. This difference persists even if the weight of the glucose-fed animals is kept equal to that of the lactose-fed group by food restriction(1). Fat deposition in rats fed prehydrolyzed lactose, *i.e.*, a 50-50 mixture of glucose and galactose, is also higher than in lactose-fed rats(1).

Recent research(2) indicates that conversion of blood glucose to lipid by adipose tissue is of importance to an understanding of the biochemical basis for obesity. Interest in the mechanism responsible for differences in fat deposition led us to compare rate of glucose uptake by the adipose tissue from rats fed various carbohydrates.

Materials and methods. Male Sprague Dawley rats were fed a diet containing glucose, lactose or a 50-50 mixture of glucose and galactose, 52; casein, 24; fat, a mixture of vegetable oils and oleo oil, 20; salt mixture, Hubbel, Mendel, and Wakeman, 4; plus an adequate vitamin mixture(1).

The epididymal fat pads from rats, killed by a blow on the head, were placed as rapidly as possible in 5 ml of Krebs-Ringer bicarbonate solution at 37° with a glucose concentration of 5 μM per ml, contained in a 50 ml Erlenmeyer flask. When added, insulin concentration was 0.1 unit per ml. Weight of the tissue was estimated by weighing the flask plus contents to the nearest 10 mg before and after addition of the tissue. After exposing to a water saturated mixture of 95% O_2-5% CO_2 at 37° for 5 minutes the flasks were kept at 37° with gentle agitation at 60 cycles per minute for 3 hours. Glucose was determined by Nelson's method(3) after deproteinization with $ZnSO_4$ and Ba $(OH)_2$; nitrogen was determined by the Kjeldahl method after defatting the tissue with ace-

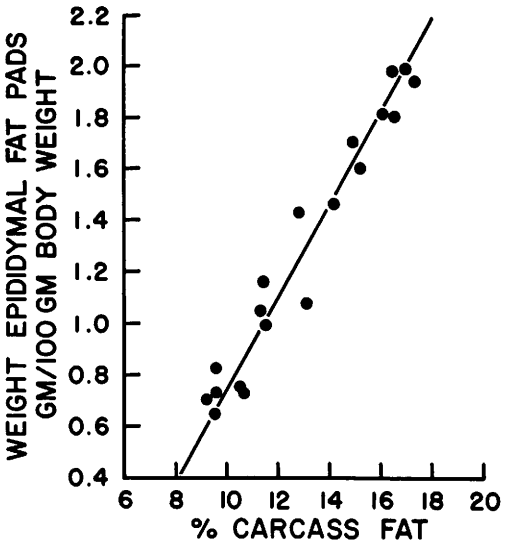

FIG. 1. Correlation between carcass fat content and weight of epididymal fat pads, % carcass fat = 6.12 + 5.49 • weight of epididymal fat pads. Average error of estimate of carcass fat content is 0.54%, range 0-1.1%. Each point represents avg of an experimental group of 5-10 weanling rats fed diets containing 52% of various carbohydrates for 6 wk.

tone and ethanol. All activity determinations were done in duplicate.

Total carcass fat was estimated from the weights of the epididymal fat bodies using the data of Fig. 1 obtained in previous studies(1). These data show that the close relationship between weight of the epididymal fat pads and carcass fat content reported by others(4,5) also applies when various carbohydrates are fed.

Results and discussion. The data obtained are shown in Table I. As is customary, calculations of activity of the tissues are based on nitrogen content, a measure of the number of cells. In the absence of insulin, rate of glucose uptake by the epididymal fat bodies from rats fed lactose was lower, though not significantly so, than in the glucose fed group. In the presence of insulin, glucose uptake of this tissue from rats fed lactose was significantly less than that of those fed glucose or a 50-50 mixture of glucose and galactose.

Reduction in food intake sufficient to restrict the weight gain of a glucose-fed group to that of a group fed lactose did not result in a reduction of rate of glucose uptake, indicating that the higher rate of glucose uptake by adipose tissue of rats fed glucose is not related to differences in food intake be-

TABLE I. Relationship between Dietary Carbohydrate and Metabolic Activity of Adipose Tissue.

	Exp. I		Exp. II			
Diet	Lactose*	Glucose*	Lactose*	Glucose*	Glucose & galactose*	Glucose, reduced intake†
	a	b	c	d	e	f
Initial body wt	132	132	65	65	65	65
Final " "	319	352	290	331	306	280
Epididymal fat bodies, g/100 g	1.10	1.88	.92	1.80	1.40	1.66
Epididymal fat bodies, mg N/g tissue	2.0	1.5	2.0	1.6	1.8	1.9
% carcass fat§	12.2	16.5	11.2	16.0	13.8	15.2
Glucose uptake, μM/mg N‡						
Without insulin	.67 ±.2	.81 ±.14				
With "	2.17 ±.27	4.13 ±.47	3.79 ±.17	5.88 ±.30	4.96 ±.42	6.46 ±.46

P values

Without insulin	With insulin			
a *vs* b = .6	a *vs* b = <.01	c *vs* d & f = <.001	c *vs* e = <.05	d *vs* e = .1	d *vs* f = .3

7 rats/group, 6 in Group c.

* *Ad libitum* feeding.

† Food intake reduced sufficiently to maintain weight close to that of lactose-fed group.

‡ Avg ± S.E. of mean.

§ Estimated from data of Fig. 1.

tween the dietary groups. The finding that the feeding of a 50-50 mixture of glucose and galactose resulted in a higher rate of glucose uptake indicates that the effect of lactose involves metabolic effects other than those of the absorbed monosaccharides.

Previous studies have shown that the *in* vitro rate of glucose uptake by liver tissue (6) and liver enzyme activities(7) varies after feeding different carbohydrates. The present results show that the glucose metabolizing activity of adipose tissue was also influenced by the carbohydrate of the diet.

The differences in glucose uptake in the *ad libitum* fed groups were directly related to weights of the epididymal fat bodies or estimated total fat content of the carcass. This relationship is in agreement with the finding that rate of triglyceride synthesis is directly related to rate of glucose metabolism by adipose tissue(2).

Summary. Comparisons were made of the *in vitro* rate of glucose uptake by the epididymal fat pads from rats fed lactose, glucose or a 50-50 mixture of glucose and galactose. Glucose uptake of insulin-stimulated adipose tissue from rats fed lactose was significantly lower than in the other dietary groups. A direct relationship was observed between rate of glucose uptake and weight of the epididymal fat pads or estimated carcass fat content.

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Transfer of Tolerance Induced by Parabiosis to Isologous Newborn Mice.* (26686)

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Tolerance of skin homografts has been induced in adult inbred mice by establishing celomic parabiosis between members of various homologous strains. For example, adult mice of the Z§ strain joined to homologous (A × Z) F_1 hybrids or to mice of the Ce strain resulted in tolerance whereby the Z partner accepted skin homografts taken from either (A × Z) F_1 hybrid cross or Ce strain donors(1). Further experimentation demonstrated that the length of time during which parabiosis had to be maintained to achieve tolerance varied according to the strains of mice joined(2). Induction of tolerance in adult mice by this procedure was interpreted as being the result of a continuous exchange of transplantation antigens in the form of intact cells between members of the pair resulting in a suppression of the homograft reaction thus permitting establishment in the homologous host of replicating cells containing the corresponding transplantation antigens(3,4).

On the other hand, our previous reports have indicated that immunological tolerance of tissue homografts induced by antigenic exposure during the neonatal period can be transferred to isologous mice by injecting these animals at birth with viable spleen cell

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§ Z is used to designate mice of the C3H strain originally obtained from Dr. J. J. Bittner's mouse colony.