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Glucose Infusion Through the External Pudic Artery.*

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In previous work the amount of lactose in the milk of cows was reduced following partial depletion of the blood glucose through the administration of insulin.[1] This led to attempts to study the effect of increased blood sugar levels upon the amount of lactose in the milk. All attempts at increasing the blood sugar for any period of time failed when glucose was injected intravenously.[2] Intramammary duct injections of glucose solutions were also used but resorption of glucose by this method also failed to increase the blood sugar.[3]

To study the effect of increased blood sugar upon the quantity of lactose formed in the milk it became apparent that the additions of glucose must be made to the arterial blood and preferably immediately before entering the mammary gland. If glucose is added to the arterial blood of the external pudic artery, the arterial blood passing through the mammary gland will be augmented to the extent of the addition. Accordingly, the technique described by Boyd and Petersen[4] was employed to secure puncture of the external pudic artery and isotonic solutions of glucose were infused over periods up to 6 hours in duration.

The infusion was effected by elevating the aspirator to cause flow by gravity. During the infusion the experimental subject was milked at frequent intervals and the urine was sampled for analysis. As the infusion was performed on the right side of the udder the milk from the left side served as a check as well as the samples before the experiment.

* Published with the approval of the Director as Paper No. 1380, Scientific Journal Series, Minnesota Experiment Station.

1 Petersen, W. E., Hewitt, E. A., Boyd, W. L., and Brown, W. R., *J. Am. Vet. Med. Assn.*, 1931, **79**, 217; Brown, W. R., Petersen, W. E., and Gortner, R. A., *J. Dairy Science*, 1936, **19**, 147.

2 Brown, W. R., Petersen, W. E., and Gortner, R. A., *J. Dairy Science*, 1936, **19**, 177.

3 Brown, W. R., Petersen, W. E., and Gortner, R. A., *J. Dairy Science*, 1936, **19**, 243.

4 Boyd, W. L., and Petersen, W. E., to be published.

The lactose contents of the milks for both halves of the udder are given for: (a) the average of 3 days' preliminary milkings, (b) 3 milkings during the experiment, and (c) the next 2 milkings following the experiment.

TABLE I.
Influence of Infusion upon Lactose Content of Milk.

Exp.	Side of Udder	Preliminary %	Experimental Milks 1st %	2nd %	3rd %	Two Milkings following Experiment Evening %	Next morning %
1	Right	4.2	4.4	4.2	4.5	5.7	5.2
	Left	4.3	4.7	4.1	5.0	5.8	5.6
2	Right	4.6	4.7	4.6	4.1	4.6	4.7
	Left	4.7	4.7	4.7	4.5	4.6	4.6
3	Right	4.7	5.4	4.8	5.2	4.9	5.0
	Left	4.8	5.6	4.7	4.7	4.8	5.1
4	Right	4.9	5.0	4.8	4.9	4.7	5.0
	Left	4.8	4.8	4.9	4.9	4.8	5.1

TABLE II.
Duration of the Experiments and the Quantities of Isotonic Glucose Solution Infused.

Experiment No.	Duration Hr.	Amount infused Liters
1	4	15
2	6	27
3	6	24
4	5	20

It is to be noted that there is from a slight to a significant increase of lactose in the milks following the experiment and varied effects upon the lactose during the infusion. As the effects are the same for both halves of the udder the results cannot be attributed to the increased glucose content of the blood.

In a few cases the blood sugar was determined upon the venous blood secured from mammary vein punctures close to the udder. The total sugar content varied from 206 to 361 mg. %. All experiments were accompanied with marked diuresis. The total reducing sugar content of the urine, according to the Tauber and Kleiner method,[5] reached a high in the middle of experiment 2. At this point there were 1.5% total sugar and 0.308% lactose. The urine before the experiment averaged .110 total reducing sugar and .064% monose.

It is apparent from the data presented that the lactose content

[5] Tauber, H., and Kleiner, I. S., *J. Biol. Chem.*, 1933, **99**, 249.

of milk is not increased by increasing the glucose content of the arterial blood. Milks following the perfusion experiments have increased lactose contents that must be explained on some other basis than the effect of increased glucose content of the blood.

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Limits of the Optically Active Cortex of the Rabbit.*

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The approximate coincidence of the optically excitable area with the area striata as defined histologically may be inferred from the work of Kornmuller[1] on the Berger rhythm, and of Bartley and Bishop[2] on responses to stimulation of the optic nerve. We have here examined the limits of optic cortex histologically and physiologically in the same animals. The physiological technique has been described (Bartley and Bishop[2]).

Ten animals were used. In 5 the indifferent electrode was fastened to bone adjoining the exposed cortex; in 5, it was plunged through the cortex to the subjacent white matter. In the animals of both series the local recording electrode was moved across the margins of the optic area, recording consecutively from series of points. Identifying stabs served to locate recorded points in 20 micron frontal sections cut serially from the cortex studied. The serial sections from each brain were used to reconstruct the histological boundaries of the area striata at 10 diameters (Fig. 1A). Upon these reconstructions were entered the physiological data.

The *lateral* border of the area striata, determined by the histological criteria of Rose,[3] coincided closely with the functionally defined limit of the optically active area. In our histological preparations a transition zone of 1 to 2 mm. width occurred between the area striata and the neighboring area occipetalis which we could not assign exclusively to either field. The stabs which identified recorded

* Aided by a grant from the Rockefeller Foundation to George H. Bishop for research in neurophysiology.

1 Kornmuller, A. E., *Biol. Rev.*, 1935, **10**, 383.

2 Bartley, S. H., and Bishop, G. H., *Am. J. Physiol.*, 1935, **10**, 149.

3 Rose, M., *J. Psych. u. Neur.*, 1931, **43**, 353.