micro-organisms and on mammals and birds remains to be investigated.

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RATIONS FOR THE STUDY OF THE RELATIVE NUTRITIVE VALUE OF FATS AND OILS

DATA have shown butter fat to have superior growth-promoting value for the albino rat as compared to certain vegetable oils: (1) on a diet of mineralized raw skimmed milk into which the various fats and oils have been homogenized;[1] (2) on a basal diet of ether-extracted mineralized skim milk powder[2]; and (3) on a synthetic type ration containing *lactose 32,* casein (fat free) 28, liver extract 1–20[3] 6, salts 6, fat 28, and vitamins.[2]

Since at the present time there is great interest in the nutritional value of fats, we felt that our data would be of aid to workers in the field. In the present study weanling albino male rats of the Sprague-Dawley strain were given *ad libitum* a basal diet of the following composition: *lactose 48,* casein (fat free) 20, fat 28 and salts IV[4] 4 per cent., respectively. Vitamins added per 100 gm of ration: thiamine 0.5 mg; riboflavin 0.5 mg; nicotinic acid 0.625 mg; pyridoxine 0.625 mg; calcium pantothenate 5.0 mg; p-amino benzoic acid 30.0 mg; inositol 100 mg; choline 250 mg; β-carotene 0.56 mg; α-tocopherol 2.24 mg; calciferol 0.014 mg; and 2-methyl-1, 4-naphthaquinone 0.21 mg. The results recorded in Table 1 show the average number of grams gained during the period of six weeks by rats fed butter fat or corn oil on both the 32 per cent. lactose ration[2] and on the 48 per cent. lactose ration. Rough and discolored fur coats, blood-stained noses and scaly paws (when the humidity was not abnormally high) were noted in the rats fed the 48 per cent. lactose ration containing corn oil. Thus greater differences were found between the nutritive value of butter fat and corn oil in the young rapidly growing rat when the lactose content of the ration was raised from 32 to 48 parts, and the liver concentrate was omitted entirely.

TABLE 1

	32 per cent. lactose ration	48 per cent. lactose ration		
Experiment No.	53, 54, 62	78	81	84
No. of rats on each fat	15	6	6	6
Butter fat. Gain in six weeks	197 gm	164 gm	174 gm	156 gm
Corn oil. Gain in six weeks	168 gm	124 gm.	131 gm	118 gm
Difference	29 gm	40 gm	43 gm	38 gm

TABLE 2

Diet exclusive of fat	Fat	Average gain in gm in six weeks
Skim milk powder 70	Butter fat 30	219*
Skim milk powder 70	Corn oil 30	200*
Difference		19
Skim milk powder 50, lactose 20	Butter fat 30	214
Skim milk powder 50, lactose 20	Corn oil 30	172
Difference		42
Skim milk powder 50, dextrose 20	Butter fat 30	221
Skim milk powder 50, dextrose 20	Corn oil 30	217
Difference		4

* Average of 12 male rats.

Likewise, an increased level of lactose on a skim-milk powder basal ration accentuates the difference in the nutritive value of butter fat and corn oil. The ration was prepared as described,[2] and the experiment set up as shown in Table 2. These data represent the average growth over a six-week period by six male rats, in each group.

It is apparent that lactose has an as yet unknown effect on intestinal conditions which is counteracted by butter fat but not by corn oil.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE FRACTIONAL CEPHALIN-CHOLESTEROL FLOCCULATION TEST

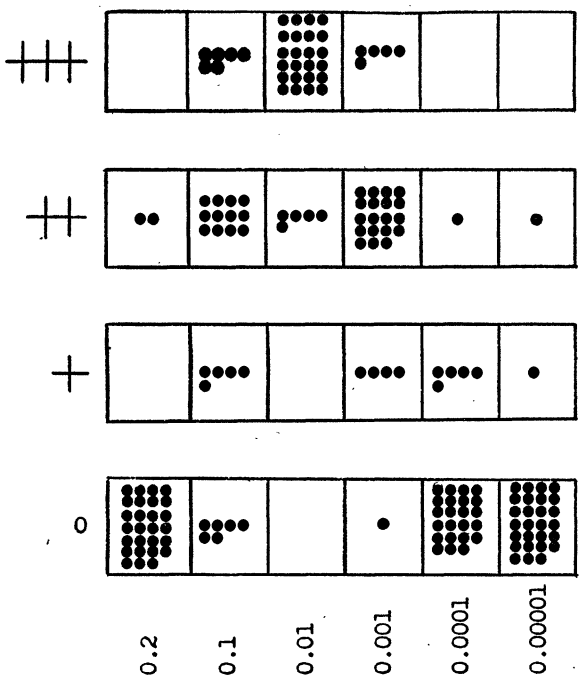
IN a recent communication, Bruger[1] proposed a fractional cephalin-cholesterol flocculation test to be used as an index of increasing or decreasing hepatic pathology. The modification consisted in the utilization of increasing dilutions of serum with saline and noting the flocculation according to the procedure originally described by Hanger.[2] The data presented

[1] E. J. Schantz, C. A. Elvehjem and E. B. Hart, *Jour. Dairy Science,* 23: 181, 1940.
[2] R. K. Boutwell, R. P. Geyer, C. A. Elvehjem and E. B. Hart, *Jour. Dairy Science,* 26: 429, 1943.
[1] M. Bruger, SCIENCE, 97: 585, 1943.
[3] A fat-free water extract. One part equals twenty parts of whole fresh liver.
[4] P. H. Phillips and E. B. Hart, *Jour. Biol. Chem.,* 109: 657, 1935.

in support of the modified test does show that, when repeated at various intervals, changes occur which could be interpreted as indicative of increasing or decreasing dysfunction.

In the application of a similar procedure to routine studies, we studied a series of normal individuals, using the proposed fractional test.[3] It was noted that, whereas with 0.2 cc of undiluted blood serum a negative reaction would occur in nearly every instance, a positive reaction was noted when 0.1 cc of saline-diluted serum or less was employed (Fig. 1). This

FLOCCULATION AT VARIOUS DILUTIONS OF SERUM WITH SALINE



was particularly the case with greater dilutions of serum with saline, so that with 0.01 cc of diluted serum a definitely positive reaction usually occurred.

Accordingly, it is obvious that the fractional cephalin-cholesterol flocculation test by means of serial saline dilutions of blood serum is not a valid procedure for following alterations in hepatic function.

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[2] F. M. Hanger, *Jour. Clin. Invest.*, 18: 261, 1939.

[3] We are indebted to Dr. David Klein, The Wilson Company, for generous supplies of a standardized Cephalin-Cholesterol mixture.

A TECHNIQUE FOR DIFFERENTIATING THE CELLS OF THE PITUITARY OF THE RAT

IT is well known that procedures worked out for staining human tissues do not always give good results when used on animal tissues. In connection with some work done in this department it was necessary to devise a stain to differentiate the acidophils and basophils of the pituitary of the rat. Mallory connective tissue stain, using the procedure described in Mallory, "Pathological Technique," does not give satisfactory differentiation, but the adaptation here described, using somewhat different dye concentrations, different staining times and a different staining temperature, has given excellent results. The procedure is as follows:

Fixation: Fix in Helly's fluid and imbed in paraffin. Cut sections 4 micra in thickness.

Staining: (Note: Control each step under the microscope; all times given are average).

(1) Stain approximately 5 minutes in a 0.1 per cent. (aqueous) solution of acid fuchsin.

(2) Wash in water, then differentiate 1–2 minutes in water containing 8 drops glacial acetic acid per 100 cc.

(3) Aniline blue stain

Aniline blue (w.s.)	0.5 gm
Orange G	1.3 "
Phosphotungstic acid 1 per cent. (aqueous) solution	100.0 cc

Stain at 35–40 degrees C for 10–15 minutes. Wash off excess stain in water.

(4) Dehydrate quickly in 95 per cent. and absolute alcohols. Clear in xylol, mount in balsam.

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