inhibition (C). These concentrations could then be used to calculate the "phenol-coefficient" (C_{phenol}/C_x) for *Bact. coli,* and the "toxicity-index" ($C_{bact.}/C_{liver}$) for liver-cells. These values, for our series of disinfectants, are shown in Table I.

TABLE I.
Comparative Values Obtained by the Manometric Method for Representative Disinfectants.

Disinfectant	C_{bact} %	C_{liver} %	Phenol Coefficient $\frac{C_{phenol}}{C_x}$	Toxicity Index $\frac{C_{bact}}{C_{liver}}$
Phenol	.26	.23	1.0	1.1
Iodine (tincture)	.0425	.0165	6.1	2.6
Mercuric chloride	.00085	.004	306	0.21

Further work will correlate these data with those given by the usual methods, and by animal test, for several representative disinfectants.

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Comparison of Vitamin B_1 Content of Raw and Evaporated Milk by the 10-Day Bio-Assay Method.

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The amount of vitamin B_1 destroyed in the process of dehydration and sterilization involved in the production of evaported milk has been variously reported. Hartwell,[1] by means of lactation tests, found approximately a 50% destruction in some of the milks tested, 33 cc. of fresh cow's milk being almost enough and 50 cc. quite sufficient to meet the needs of the lactating rat and 6 young, when used in conjunction with the basal ration; whereas 75 cc. of evaporated milk was found to be too little. Daniels and Brooks,[2] and Daniels, Giddings, and Jordan,[3] using a similar technique with a slightly modified diet, obtained similar results. Feeding tests with

[1] Hartwell, G. A., *Biochem. J.*, 1925, **19**, 226.

[2] Daniels, A. L., and Brooks, L., PROC. SOC. EXP. BIOL. AND MED., 1927, **25**, 161.

[3] Daniels, A. L., Giddings, M. L., and Jordan, D. P., *J. Nutr.*, 1929, **1**, 455.

pigeons (Donath,[4] and Daniels and Brooks[2]) also indicated that the evaporated milks tested contained approximately 50% less vitamin B_1 than the raw milk used in comparative tests.

Samuels and Koch,[5] on the other hand, by 2 different methods: a modification of the Hartwell[1] lactation test, and a direct feeding procedure, found only about one-sixth less vitamin B_1 in the evaporated milks, while Dutcher, Francis and Combs[6] believe the difference in the potency of raw and evaporated milk to be so slight as to be negligible. These authors state: "Vitamin B is not readily destroyed by the evaporation process used, and only under unusual conditions would we expect the deficiency of commercial evaporated milk to be due to the process of manufacture."

The lack of unanimity in these reports has led to a study of the vitamin B_1 content of raw Guernsey milk (4.5% fat) and commercial evaporated milk (diluted 1:1) by a modification of the 10-day bio-assay method of Schlutz and Knott.[7] Young rats at weaning were fed a purified vitamin B_1-free ration consisting of: 20 gm. triple precipitated alcohol-extracted casein, 54.5 gm. cane sugar, 19 gm. Crisco, and 3.5 gm. Wesson's salt mixture.[8] In addition, each animal received 2 drops of cod liver oil. The other essential components of the vitamin B complex were supplied in certain of the tests by giving each day 0.5 gm. of whey* autoclaved 2 hours at 120°C. On the assumption that raw milk at the levels fed, contained enough of these other vitamin B complexes, some tests were made with raw milk and the basic ration without the supplement in order to rule out the influence of possible small amounts of vitamin B_1 in the autoclaved whey. The tests with evaporated milk included the 0.5 gm. autoclaved whey. In other tests, in order to make sure that vitamin B_1 only was concerned in the growth stimulation, assay animals were given the basic ration with evaporated milk (diluted 1:1) in amounts comparable to those used in the raw milk studies, and in addition, sufficient crystalline B_1 (Betaxin†) to make a daily gain of between one and 2 gm.

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[4] Donath, W. F., *Mededeelingen van den Dienst der Volksgezondheid in Ned.-Indie*, 1929, **2**, 152.

[5] Samuels, L. T., and Koch, F. C., *J. Nutr.*, 1932, **5**, 307.

[6] Dutcher, R. A., Francis, E., and Combs, W. B., *J. Dairy Sci.*, 1926, **9**, 379.

[7] Schlutz, F. W., and Knott, E. M., *J. Nutr.*, 1936, **12**, 583.

[8] Wesson, L. G., *Science*, 1932, **75**, 339.

* Supplied through the courtesy of the Western Condensing Company, San Francisco, California.

† Supplied through the courtesy of the Winthrop Chemical Company, Inc., New York.

The autoclaved whey supplement in the amounts fed contained no vitamin B_1 or so little that it was without influence on the test animals. The control animals receiving the basic diet with this supplement, died in from 28 to 32 days without manifesting any of the reported symptoms of polyneuritis.

Subsequent to our first tests, animals were again depleted by the technique described, and when holding, were tested during second and third periods; thus the averages of the initial weights of the animals are slightly higher than designated in the original method. This seemingly has not influenced the results. Provided an animal is in the rapidly growing stage and is adequately depleted, his initial weight is not of major concern. The raw milk tests were made in June and July, whereas the evaporated milk tested, which was put out by the same manufacturer, was obtained from different lots, one purchased in the open market in July, and a second and third in December and January.

According to the vitamin B_1 assay method used, a unit of vitamin B_1 is the amount which makes possible a gain of 1 gm. per day in an assay animal during a 10-day test period when the rate of gain has been limited to between 1 and 2 gm. a day. Seventeen test animals receiving the basic diet with no supplement gained during the assay period an average of 1.45 gm. per day when 7 cc. of raw milk were fed, whereas 13 rats receiving the basic diet with the addition of 0.5 gm. of autoclaved whey per rat per day gained 1.5 gm. per day with an average ingestion of 7 cc. of raw milk per day. The results by these methods are within the limits of experimental error and indicate that 5.3 cc. (average) of the raw milk tested contained 1 unit of vitamin B_1. Similar tests with evaporated milk show that over twice as much, namely, 12.6 cc. was needed to produce the same amount of gain in the test animal. These findings are further emphasized by the results with the evaporated milk and crystalline B_1. In order to obtain comparable growth when equivalent amounts of raw and evaporated milk, 7 cc. respectively, were fed, with the autoclaved whey supplement it was necessary to add 4.0γ of crystalline B_1 which assays 5.7γ per unit.[9]

An estimation of the amount of the vitamin B_1 destroyed in the evaporated milk tested on the basis of the raw milk assayed, indicates a loss of 60%. These findings are in accord with those of workers (Hartwell, Donath, and Daniels, *et al.*) who have not used yeast as such or autoclaved, as part of the basic test ration. Bio-assays of raw milk with the basic ration and a 0.5 gm. autoclaved

[9] Unpublished data.

TABLE I.
Ten-day Bio-assay of Raw and Evaporated Milk.

No. Rats	Milk		Supplement		Weight		Wt. gain per day gm.	Milk for 1 gm. gain	
	Kind	Av. per day cc.	Kind	Amt. gm.	Initial gm.	End gm.		Av. cc.	Stand. Error
13	Raw	7.8	Whey†	0.5	84.0	98.9	1.50	5.2±1.6	.42
17	"	7.9	—	—	79.3	93.8	1.45	5.4±0.9	.94
4	"	6.8	Yeast‡	0.5	82.3	104.8	2.25	3.0 —	—
26	Evap.*	21.2	Whey†	0.5	80.5	97.3	1.68	12.6±2.0	.39
8	"	7.2	Whey†	0.5	70.1	85.2	1.51	— —	—
			Betaxin§	4.0γ					

*Evaporated milk diluted 1:1.
†Autoclaved 2 hr. at 120°C. natural pH.
‡Autoclaved 6 hr. at 120°C. natural pH.
§Betaxin assays 5.7γ per unit when basal B_1 free diet is supplemented with 0.5 gm. autoclaved whey per day. (Unpublished data).

yeast (6 hours at 120°C.) supplement, gave higher values for the raw milk than when no supplement or when autoclaved whey was used (3.0 cc. against 5.3 cc. for one unit of vitamin B_1), suggesting that the higher values obtained when autoclaved yeast is used to supply the other components of the vitamin B complex are due to the presence of some vitamin B_1 in the supplement.

It is concluded that commercial evaporated milk contains about 60% less vitamin B_1 than an equivalent amount of raw summer milk.

9796 P

Reduced Latent Time of Blocking of the Berger Rhythm to Light Stimuli.

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Recent reports[1, 2] have indicated that when a subject is instructed to respond manually to a light stimulus the latent time of blocking of the Berger Rhythm (the *a*-wave of the electroencephalogram) is shorter than it is when no response is made. One of these reports[2] includes a correlation of $.37 \pm .09$ between reaction time and latent time of blocking. This might be held as indicative of a relationship between "readiness" of the subject and the blocking time.

The present report is concerned with the same general phenomenon, but with a different emphasis in the approach. The aim here is to discover, if possible, the factors involved in the reduction of the latent time of blocking.

A series of experiments was run to verify the results of the previous investigators. Ten normal adult subjects were used. Standard equipment for recording included resistance-capacitance coupled amplifiers driving an ink-writing oscillograph. Plate electrodes were placed on the left occipital area and on the lobe of the left ear. The stimulus lights were of an intensity of 0.3 cp. Response, when made, was by a break key inserted in the light circuit and activating the signal magnet of the ink-writer.

The verification experiments involved 3 situations. (1) A situation of no response. (2) A situation demanding discrimination

[1] Travis, L. E., Knott, J. R., and Griffith, P. E., *J. Gen. Psychol.*, 1937, **16**, 391.
[2] Jasper, H. H., and Cruikshank, R. M., *J. Gen. Psychol.*, 1937, **17**, 29.