

TABLE I.

| Diet | No. of Rats | Av. Weight (gm.) | | Av. Hemoglobin (gm. per 100 cc.) | | Av. Erythrocytes (per cu. mm.) | |
|-----------------|-------------|------------------|--------|----------------------------------|--------|--------------------------------|-----------|
| | | Init. | Final† | Init. | Final† | Init. | Final† |
| Raw Milk | 5 | 33.0 | 59.0 | 14.01 | 2.18 | 6,770,000 | 2,750,000 |
| Evaporated Milk | 5 | 35.3 | 87.9 | 12.07 | 5.81 | 6,560,000 | 7,220,000 |
| Raw Milk + Cu | 6 | 35.8 | 66.6 | 10.39 | 4.13 | 5,591,000 | 4,786,000 |

† At end of 8 weeks except for animals on raw milk alone (7 weeks, 3 days).

One may conclude that the maintenance of a normal erythrocyte count for 8 weeks when evaporated milk is fed as the sole article of diet is due in part at least to the copper content of the evaporated milk, as a similar though less marked effect is obtained when raw milk is supplemented with copper.

The recent report of Schultze² that, even when the diet is poor in iron, copper fed to young anemic rats has an erythropoietic action without stimulating hemoglobin regeneration is supported by our experimental findings.

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Determination of Colloid Osmotic Pressure of Blood Serum.

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Results of previous workers from Starling¹ to Krogh and Nakazawa² have shown the colloid osmotic pressure of the blood serum to vary between 265-420 mm. of water pressure, with average values of approximately 310-360 mm.

Osmotic pressures reported here have been obtained with a greatly modified apparatus using aseptic technique, an accurately controlled constant temperature water bath at 30°C., and modified Ringers as a dialyzing agent. The figure shows osmometer tube (C) with (Dupont No. 300 plain transparent cellophane) membrane attached, which is filled with blood serum; (D) is capillary tube attachment for noting blood serum meniscus; (E) is stopcock

² Schultze, K. W., *Klin. Wchnschr.*, 1932, **11**, 497.

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¹ Starling, E. H., *J. Physiol.*, 1896, **19**, 312; 1899, **24**, 317.

² Krogh, A., and Nakazawa, F., *Biochem. Z.*, 1927, **188**, 241.

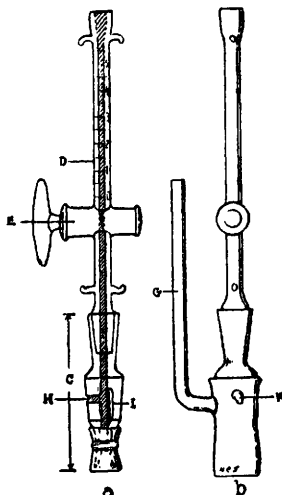


FIG. 1.

to prevent rise of serum in capillary during development of pressure. (A) is fitted into (B) which shows saline tube (F) with side arm (G) for filling or for removing bubbles from serum tube through orifice (H) or side arm can be turned to groove (I) allowing air to enter outer system, thus preventing the production of a vacuum. The 3 parts are fastened together by means of springs over small glass hooks. The osmometer is immersed in a constant temperature bath up to the stopcock and attached to a manometer.

It has been inferred that a low serum protein value means a lowered serum osmotic pressure. Accordingly, a short series of readings was done on dog serum obtained from dogs which were undergoing plasma-pheresis³ and whose serum protein values were consequently much lower than those of normal dogs, being from 3.65 to 5.27 gm. per 100 cc. of serum as compared with 6.35 to 6.60 gm. per 100 cc. of serum for the normal animals. The serum osmotic pressures (measured by Krogh's method⁴), when compared with similar determinations on normal dogs, were also found to be definitely lower, 93 to 225 mm. of water pressure with normal values showing 292 to 334 mm. of water pressure; however, it is now felt that the determinations may have been somewhat inaccurate because of the method used. At the time the above observations were made there had been no attempt either to observe sterile precautions in handling serum or to maintain a uniform temperature throughout

³ Lepore, M. J., *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **29**, 318.

⁴ Krogh, A., *The Anatomy and Physiology of Capillaries*, Yale U. Press, 1922.

the experiment. Elimination of these variables seems highly desirable.

Determinations of osmotic pressures of 11 apparently normal medical students give values ranging from 321 to 380 mm. of water. The serum albumin and serum globulin were determined by analysis using the method of Wu and Ling⁵ and give values of 6.32 to 6.81 gm. of protein per 100 cc. of serum. In calculating osmotic pressures from these protein values the data of Govaerts were used (75.4 mm. of water pressure per gm. of albumin and 19.5 mm. of water pressure per gm. of globulin) and the osmotic pressures were found to be 361 to 394 mm. of water, values which are consistently higher than those obtained by direct measurement.

Our results indicate a fair degree of accuracy and it is hoped that with the accumulation of more extensive data a better correlation between observed and calculated osmotic pressures may be obtained.

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A Note on the Minimal Fatal Dose of Nicotin for Unanesthetized Dogs.

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The following observations were made as part of a study of the cause of death in nicotin poisoning in dogs. Sollmann¹ mentions that 2 drops of nicotin placed on the gums of a dog may rapidly cause death. Blake² injected 2 drops of nicotin into the jugular vein of a dog, death occurring about one minute and a half after the administration of the poison.

At the time we carried out our experiments we were not aware of any reports in the literature dealing with the minimal fatal dose of nicotin for dogs. von Anrep³ reports that 1.5 drops of nicotin

⁵ Wu and Ling, *Chinese J. Physiol.*, 1927, **1**, 161.

¹ Sollmann, *Manual of Pharmacology*, 1922, Saunders, Philadelphia.

² Blake, *Edinb. Med. and Surg. J.*, 1840, **53**, 35.

³ von Anrep, *Arch. f. Physiol.*, Leipz, 1879, Suppl. Bd., 167-191.