8176 P

Influence of Amino Acids and of Protein Diet Upon Creatine Content of the Myocardium.

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Beard and Barnes[1] have reported that the feeding of various amino acids and proteins resulted in an increase in the creatine (total creatinine) concentration in skeletal muscle tissue. Preparatory to a study of the influence of dietary ingredients upon the reduction in the creatine content of heart muscle, produced by experimental thyrotoxicosis[2] and other procedures, the influence of feeding various amino acids and of the protein intake upon the creatine content of the myocardium was observed.

Adult rats were fed the special diets for a period of 2 weeks. The 3 casein diets all contained 4% of the Osborne and Mendel salt mixture, 10% of brewers yeast, 10% cod liver oil and 15% lard. In order, they contained 6, 20 and 55% of casein, and 55, 41 and 6% respectively of cornstarch. The 20% casein diet served as the control diet and for the addition of amino acids. Muscle creatine was determined by the method of Rose, Helmer and Chanutin.[3]

Table I shows that the higher the protein content of the diet the

TABLE I.
Creatine Concentration.

No. of Rats	Sex	Body Weight	Myocardium —Mg. %— Low	High	Aver.	Skeletal Muscle —Mg. %— Low	High	Aver.	Diet
4	♂	314	160	184	169	375	417	397	Control
4	♀	237	187	200	192	372	403	382	"
3	♂	347	162	200	179	357	388	374	5% Glycine
3	♀	227	182	192	187	366	440	405	5% "
7	♂	212	177	232	208	393	452	420	10% "
5	♀	155	205	235	220	389	445	409	10% "
3	♂	199	189	211	197	408	446	428	10% Alanine
4	♀	149	196	225	209	413	481	448	10% "
4	♂	221	165	197	180	388	430	408	10% Glutamic Acid
2	♀	170	190	207	198	411	442	426	10% " "
6	♂	226	185	227	212	420	440	434	6% Casein Diet
6	♀	185	177	264	207	417	474	439	6% " "
6	♂	357	175	198	181	388	417	401	20% " "
6	♀	215	169	195	183	372	440	401	20% " "
7	♂	205	164	188	175	379	415	405	55% " "
7	♀	166	163	193	176	374	435	403	55% " "

[1] Beard, H. H., and Barnes, B. O., *J. Biol. Chem.*, 1931-32, **94**, 49.

[2] Cowan, D. W., *Am. J. Physiol.*, 1934, **109**, 312.

[3] Rose, W. C., Helmer, O. M., and Chanutin, A., *J. Biol. Chem.*, 1927, **75**, 543.

lower the concentration of creatine in the myocardium. This is surprising and may be due to the variable carbohydrate intake, a point which is being examined. The addition of glycine or dl-alanine to the diet definitely raised the amount of creatine in the heart muscle, d-glutamic acid was not so effective. The relative effects of the various amino acids, particularly over short periods of time in the same manner as used by Beard and Barnes[1] for skeletal muscle, should be determined.

8177 C

Sodium Propyl-methyl-carbinyl Allyl Barbiturate, a Short Acting Hypnotic.

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Fitch, Waters, and Tatum[1] in their extensive work on barbituric acid hypnotics emphasized the importance of employing short acting members for surgical procedures. Among the different derivatives synthesized by Shonle and his associates,[2, 3, 4] the sodium salt of propyl-methyl-carbinyl allyl barbituric acid appears to have the desirable promptness and brevity of action. The same compound has been prepared by Tabern and Volwiler.[5]

By following Eddy's scheme of recording results,[6] it was found that in rats by intraperitoneal injection the minimal anesthetic dose (M.A.D.) was 40 mg. and the minimal lethal dose (M.L.D.) 110 mg., per kg. Twenty mg. per kg. by the same route of administration were sufficient to induce sleep. These animals, 220 in number, weighed on the average 94 gm. In dogs by intravenous injection of a 5% solution at the rate of 1 cc. per minute, the M.A.D. was ascertained to be 25 mg. and the M.L.D. 50 mg., per kg. By mouth in the same species of animal the M.A.D. was determined to be 35 mg. and the M.L.D. 90 mg., per kg. A total of 83 dogs were used.

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2 Shonle, H. A., Keltch, A. K., and Swanson, E. E., *J. Am. Chem. Soc.*, 1930, **52**, 2440.

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4 Shonle, H. A., *J. Am. Chem. Soc.*, 1934, **56**, 2490.

5 Tabern, D. L., and Volwiler, E. H., *J. Am. Chem. Soc.*, 1934, **56**, 1139.

6 Eddy, N. B., *J. Pharm. and Exp. Therap.*, 1928, **33**, 43.