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Nutrition of the Mouse. XII. Comparison of Several Salt Mixtures.* (20008)

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Although a wide variety of salt mixtures, many of these commercially available, is in use in nutritional experiments with mice, there is at the present time little information about the relative merits of these preparations. For this reason we decided to compare five salt mixtures fed at a 5% level as part of an otherwise complete synthetic diet.

Method. Weanling mice of the C57 and I strains were divided into 5 comparable groups, each receiving the same basal diet (Table I)

TABLE I. Composition of Diet in %.*

Casein	30	Corn oil	5
Dextrin	50	Salt mixture	5
Crisco	10		

* Vitamins added in amounts described by Fenton and Carr(4).

but a different salt mixture. The following preparations were employed: Hubbell, Mendel and Wakeman(1), Wesson(2), U.S.P. XII No. 2, McCollum and Simmonds No. 185(3) and Fenton and Carr(4). The mice were housed in individual screen-bottom metal cages in a constant temperature room. Food and water were supplied *ad libitum*. The animals were weighed once each week and sacrificed when 135 days of age. At this time determinations of water, fat and ash content were carried out.

Results and discussion. The experimental results are summarized in Table II. Although variations among groups were encountered with respect to final body weight and total fat content, no striking effects of varying the salt mixture were seen. With each salt mixture employed there was, however, considerable difference between the 2 strains of mice with respect to final body weight and total carcass fat. The dry, fat-free weight of all groups of mice was virtually the same. Plotting the body fat content against percent body water showed the inverse linear relationship already reported by other investigators. The ash content of mice fed the diet containing Hubbell, Mendel and Wakeman salts was significantly higher than the ash content of any other group. This was true for both strains of mice. The values obtained for total ash content are in good agreement with those of Morris(5).

The most striking difference between the salt mixture described by Hubbell, Mendel and Wakeman and that described by Fenton and Carr lies in the Ca:P ratio. This ratio is close to unity in the Fenton and Carr mixture but is considerably higher in the Hubbell, Mendel and Wakeman preparation. For this reason a new salt mixture was prepared differing from the original Fenton and Carr preparation in that some of the calcium phosphate was replaced by calcium carbonate, thus retaining essentially the same calcium level but decreasing the phosphorus content. Two groups of 12 mice each were fed identical diets but one receiving the old while the other received the new salt preparation. The ash content of these mice when sacrificed at 135 days of age differed significantly, the new salt mixture giving a higher total body ash.

Summary. Five salt mixtures were tested for their ability to support growth as well as

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TABLE II. Results of Carcass Analysis.

Salt mixture	Strain	No. of mice	Final body wt, g	Dry wt, g	Dry, fat-free wt, g	Fat, g	Ash, g
Hubbell, Mendel and Wakeman	C_{57}	6	31	13.4	6.2	7.2	.93 ± .016*
	I	5	29.6	10.7	6.5	4.3	.95 ± .015
Fenton and Carr	C_{57}	8	28.9	11.7	5.8	5.8	.86 ± .009
	I	5	26.4	8.3	5.8	2.5	.86 ± .015
Wesson	C_{57}	6	28	11	5.8	5.2	.85 ± .011
	I	5	26.9	9.1	5.8	3.5	.88 ± .021
U.S.P. XII #2	C_{57}	6	32.2	13.9	6.2	7.7	.84
	I	5	25.7	8.7	5.8	3	.86 ± .014
McCollum-Simmonds #185	C_{57}	6	29.8	12.4	6.1	6.3	.83 ± .007
	I	5	26.3	9.1	5.8	3.2	.84 ± .014

* Stand. error.

fat and mineral deposition in the carcass. Feeding the mixture described by Hubbell, Mendel and Wakeman(1) resulted in significantly higher ash values than when the other four mixtures were employed. Increasing the Ca:P ratio of the Fenton-Carr mixture(4) significantly improved mineral deposition.

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Cytoplasmic Budding of Human Lymphocytes Produced by Cortisone and Hydrocortisone in *in vitro* Preparations.* (20009)

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The destructive changes that lead to lymphocytic dissolution *in vivo* under conditions of increased adrenocortical secretions begin with cytoplasmic budding and result in pycnosis and karyorrhexis of the cells(1-3). Shedding of the cytoplasm of lymphocytes was described as a normal process in the older literature by Downey and Weidenreich and the cytoplasmic fragments were termed hyaline bodies(4). The observation of cytoplasmic budding of lymphocytes in this laboratory in blood films of patients treated with ACTH and cortisone led to an attempt to produce this phenomenon by treating lymphocytes isolated from buffy coat of normal human blood with cortisone and hydrocortisone *in vitro.*

Materials and Methods. Crystalline hydrocortisone (free alcohol) and cortisone (free alcohol) were used in these experiments. Ethylene bisiminodiacetic acid (Sequestrene Na_2) was used as an anti-coagulant according to the technique of Proescher(5). Fifteen ml samples of venous blood from normal human subjects were centrifuged in sterile tubes containing 0.1 ml of a 10% solution of Sequestrene Na_2. The hormone to be tested was added to a portion of plasma so that 1 ml of plasma contained 1 mg of hormone. Non-hormone treated plasma from the same sample was used for control studies. A drop of

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