C × C3H males. Hypophysectomy was performed at 8 weeks of age, and implants were made 6, 21, and 35 days later into groups of 8, 5, and 5 hypophysectomized and 5, 3, and 2 control animals, respectively. All animals were weighed on the day of hypophysectomy and weekly thereafter. Operated animals lost approximately 15% of their weight during the first week. Subsequently, their weight appeared to stabilize for 2 weeks and then declined slowly for the remainder of the experimental period. Total extirpation of the pituitary gland was achieved in all operated mice, as ascertained by visual inspection (× 9 magnification) of the sella turcica and adjacent tissues, and by body weight data on individual animals.

The reactions of operated and control groups to the trophoblast implant were indistinguishable. In all groups intra-ocular hemorrhage appeared by 48 hr, and the reaction continued to what has been characterized as the ++ level; i.e. the whole eye became dark-red and protuberant, frequently rupturing at the incision site. In animals held longer than 7–10 days the reaction appeared to regress as previously described (*3*).

It is concluded that the intra-ocular hemorrhagic reaction to ectoplacental trophoblast in the mouse is independent not only of the particular hormonal conditions occurring in the female at the time of normal implantation but, since it occurs in full strength in animals 35 days after hypophysectomy, is independent of all hormonal background dependent upon pituitary function.

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Amino Acid Content of Dehydrated Giant African Snails (*Achatina fulica* Bowdich)[1]

Albert R. Mead and Arthur R. Kemmerer

Department of Zoology* and *Department of Nutrition*, *University of Arizona, Tucson

As a part of a plan to make a constructive approach to the serious problem of the giant African snail (*Achatina fulica* Bowdich) in the islands of the Pacific, assays of the essential amino acids were made to determine the possibility of using "snail meal" as a source of animal protein in the feeds of poultry and livestock. To our knowledge, no other tests of this nature have been made on this molluscan pest, although van Weel (*1*), and more recently Garnadi (*2*), have made tests to determine percentages of some of the basic chemical constituents.

The snails were collected alive in the field and submerged in boiling water just long enough to remove the soft parts from the shell. The carcasses were then dehydrated at moderate temperatures and reduced to a fine meal or powder in a Wiley mill. Amino acid assays of this meal were made by procedures previously reported by Kemmerer and Acosta (*3*).[2] The results of these assays are given in Table 1, with the percentages of the amino acids being shown in terms of both the snail meal sample and the total protein content of the snail meal. Unfortunately, samples were not large enough in Lots C and D to determine percentages of threonine and tryptophan.

TABLE 1

AMINO ACID CONTENT OF GIANT AFRICAN SNAIL

Protein content	Lot C		Lot D		Lot E	
	69.9		64.9		61.6	
Amino acid	%, Sample basis	%, Protein basis	%, Sample basis	%, Protein basis	%, Sample basis	%, Protein basis
Arginine	6.46	9.24	8.60	13.25	4.07	6.61
Histidine	0.96	1.38	1.02	1.57	0.99	1.62
Isoleucine	3.15	4.51	3.65	5.62	2.83	4.59
Leucine	3.43	4.91	3.77	5.81	4.64	7.53
Lysine	5.97	8.54	6.48	9.98	3.45	5.60
Methionine	0.70	0.99	0.84	1.29	0.72	1.17
Phenylalanine	2.58	3.69	2.24	3.44	2.43	3.94
Threonine	No values		No values		2.65	4.30
Tryptophan	"	"	"	"	0.38	0.61
Valine	2.97	4.25	3.16	4.87	3.18	5.16

It will be seen that the values of Lots C and D compare quite favorably. In Lot E, however, three of the amino acids show significant departures in their values—viz., arginine, leucine, and lysine. Several factors may enter into a possible explanation of these differences. Specimens in Lot E were collected in Kaneohe, Hawaii, by Philip W. Weber, of the Board of Agriculture, in April 1952 and kept in close confinement for a number of days without food or water. Snails kept under such conditions will very often suffer dietary deficiencies which may possibly be reflected in alterations in the normal basic values of constituent amino acids. Unfortunately, the paucity of research work in the metabolism of terrestrial gastropods does not permit us to determine whether possible starvation or malnutrition could effect a reduction in the levels of arginine and lysine and an increase in leucine. Specimens in Lots C and D, on the other hand, were collected in the Palau Islands (Ngarmalk Island and Ngerebeched, Koror Island, respectively) by Peter J. R Hill in April 1950 and were killed and dehydrated as quickly as possible. Dehydration was accomplished in an improvised plant dryer at a temperature, maintained by a large electric light bulb, held close to 160° F. Yoshio Kondo, of the Bishop Museum, dehydrated the Hawaiian specimens

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[2] Grateful acknowledgment is made to Judith Heimann, who made these determinations.

at a slower rate and at lower temperatures through the alternate use of sunlight and an improvised electric plate oven.

Because any difference in the environment will be reflected in the food and therefore the nutrition, this fact will continue to remain as a possible explanation for the differences between the lots from Hawaii and the Palau Islands.

At the height of reproductive activity, the albumen gland of the female conduit in these hermaphroditic animals may become so large that it actually exceeds the size of the liver or digestive gland. Because of the proteinaceous nature of albumen, the hypertrophy of this gland is almost certain to produce changes in the amino acid ratios.

A comparison of the values for Lot D with those of Dunn (*4*) indicates that arginine is nearly 2⅓ and lysine over 1⅓ times the amounts in whole egg. All other values, although appreciable and significant, fall below the values for whole egg. Similar analysis of cottonseed meal (*5*) shows that its value as a poultry and livestock feed is limited, as is almost universally the case with many other vegetable products, because of the deficiency of the very essential amino acid, lysine. The immediate inference is that this deficiency could be overcome through the addition of snail meal. Tests designed to determine both the effectiveness of this combination and the growth adequacy factors of snail meal alone are currently being set up through the use of controlled chick feeding experiments at the University of Arizona. It is expected that the results of these tests, along with additional amino acid assays, will be announced at an early date.

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Influence of Peripheral Cholinergic Blocking Drugs on Survival Time in X-Ray Irradiated Mice[1]

Thomas J. Haley and Bonnie M. Rhodes[2]

Division of Pharmacology and Toxicology, Atomic Energy Project, School of Medicine, University of California, Los Angeles

In 1949 Larkin (*1*) reported that atropine increased the survival time in x-ray irradiated mice. It was difficult, however, to understand how a dose of 0.65 mg/kg of atropine could possibly produce sufficient cholinergic blockade to influence the survival time in irradiated animals. Furthermore, if such a small nontoxic dose of atropine could favorably influence irradiation survival time, doses two and three times that amount should prove even more beneficial, because they would have a tendency to increase the effective cholinergic blockade while still remaining in the nontoxic range. Other cholinergic blocking drugs less toxic than, and almost as potent as, atropine should also prove beneficial under the above conditions.

Male CF1 strain mice, weighing an average of 20 g each, were arranged in groups of 20 animals each. Except during irradiation, the animals were maintained in an air-conditioned room at 72° ± 5° F and were given a diet of Rockland pellets supplemented weekly with additional vitamins A and D. Beginning 1 day prior to irradiation and continuing until 90–100% of the animals had died (10–16 days), each animal received daily by intramuscular injection a constant volume of 0.1 ml of the following concentrations of peripheral cholinergic blocking drugs: Group I, 0.45×10^{-3} *M*; Group II, 0.90×10^{-3} *M*; Group III, 1.35×10^{-3} *M*. The controls received 0.9% saline. The drugs used were atropine, Merck MK-02 (tropine benzhydrylether methane sulfate); Win-2299 (1-methyl-3-piperidyl-methyl-phenyl-2-thienyl acetate); and Bentyl (1-cyclohexylhexahydrobenzoic acid, β-diethylaminoethyl ester). The injections were given in alternate thighs. The 550-r radiation dose was administered from above and below the mice with two 250 kvp Picker Industrial Units operating simultaneously. The technical factors were: 250 kvp; 15 ma; FOD 100 cm, filters, 0.21 mm Cu inherent, 0.5 mm Cu parabolic, and 1.0 mm Al; HVL 2.02; size of field —total body, r/min measured in air 17.2–18.4. Both units were calibrated prior to each experiment with a Victoreen thimble r-meter. The animals were restrained in a plastic cage similar to the one previously described for guinea pigs (*2*). The results obtained were analyzed statistically by the method of Litchfield (*3*).

The results obtained with the four drugs are given in Table 1. From the data it is evident that none of the drugs had a significant effect on total mortality. Furthermore, the response of the animals to the radiation dosage was remarkably constant over the 8 months during which the experiments were conducted. This is borne out by the total mortality figures, as well as by the slopes of the time-percentage effect curves. Statistical analysis of the reaction time ratios shows that all concentrations of MK-02, the 0.90×10^{-3} M concentration of Win-2299, and the 0.45 and 0.90×10^{-3} *M* concentrations of Bentyl significantly affected the survival time of the mice in a favorable manner. From a practical viewpoint, however, the over-all differences between the ST_{50} day and the day on which 90–100% of the mice were dead are so small that such medication cannot be considered highly benecial in counteracting over-all radiation injury, but it

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