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**METABOLIC STUDIES OF ASPARTAME AND MONOSODIUM GLUTAMATE
INGESTED AS COMPONENTS OF A HAMBURGER—MILK SHAKE MEAL
SYSTEM IN NORMAL ADULT SUBJECTS**

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Introduction

The potential for interactions between aspartame (APM) and monosodium L-glutamate (MSG) are an issue to be discussed at the Public Board of Inquiry for APM. The metabolisms of glutamate and aspartame are interrelated. Thus, the metabolism of aspartame must be considered in conjunction with that of MSG when both are present in the food supply. Glutamate loads produce a rise in plasma aspartate as well as plasma glutamate concentrations (1-3). Conversely, high doses of APM produce a slight rise in plasma glutamate concentrations (4). Because of this interaction, it has been suggested that competitive catabolism of these two compounds might occur when ingested together, with resultant elevations in plasma glutamate and aspartate levels. This hypothetical increase was suggested to increase the potential for neurotoxicity (5-7).

We have recently carried out several studies to determine whether APM addition to the food supply significantly effects plasma glutamate and aspartate levels beyond that caused by the presence of MSG alone. In the first study (8, 9), plasma amino acid levels were measured in normal adult volunteers ingesting a hamburger--milk shake meal providing 1 gm of protein/kg body weight, with and without added MSG and APM. Three meal systems were studied: a) the meal alone; b) the meal with MSG added at 34 mg/kg body weight; and c) the meal with MSG added at 34 mg/kg and APM provided at 34 mg/kg body weight. These experiments demonstrated that the addition of MSG plus aspartame to a high protein meal did not increase plasma glutamate or aspartate levels above those produced by the meal itself, or the meal with added MSG. No evidence was found for a rapid early rise in plasma glutamate or aspartate levels as suggested by Olney (5,6).

Recent studies suggest that the carbohydrate content of the meals facilitates glutamate metabolism (10, 11). These findings led us to investigate the interactions of MSG and APM in a meal system containing little carbohydrate. One such typical meal might be a soup--beverage lunch consumed by diet-conscious individuals. We have recently measured plasma amino acid levels with time in 9 normal adults ingesting three soup--beverage meals (12). The study was carried out in a randomized Latin Square design. The three meal systems studied were: (a) soup with no added MSG and unsweetened beverage; (b) soup providing 50 mg MSG/kg body weight with unsweetened beverage; and (c) soup providing MSG at 50 mg/kg body weight and beverage providing APM at 34 mg/kg body weight. Mean (\pm S.D.) peak plasma glutamate plus aspartate levels were 5.33 ± 1.40 μ moles/dl after ingestion of the soup--beverage meal without added APM or MSG, and were 21.0 ± 7.14 μ moles/dl after ingestion of the meal with added MSG. The addition of both MSG and APM to the meal system did not significantly increase plasma glutamate plus aspartate levels above those noted after ingestion of the meal providing MSG alone. Mean peak glutamate plus aspartate levels were 25.7 ± 10.5 μ moles/dl. These data indicate that the addition of a large APM load to food systems containing a significant quantity of MSG had only a minimal effect upon plasma glutamate plus aspartate concentrations beyond that produced by the MSG alone.

The present study was designed to test the interactions of MSG and APM, provided at levels approximating their Advisable Daily Intake (A.D.I.), when ingested with a large amount of dietary protein-bound glutamate and aspartate. The meal systems studied provided 1 gm protein/kg body weight supplemented with either 150 mg MSG/kg body weight, or 150 mg MSG/kg plus

23 mg APM/kg body weight. Plasma amino acid levels were measured with time to determine whether the addition of APM to the meal increased plasma glutamate plus aspartate levels beyond those produced by the meal providing only MSG. This meal system should provide a maximal stress on the ability of the adult subject to handle large loads of aspartame in the presence of large loads of both free and protein-bound glutamate.

Materials & Methods

Six normal, healthy adult subjects were studied, 3 male and 3 female. The proposed study was fully explained to each subject and informed, written consent obtained. The protocol of the study was reviewed and approved by the Committee on Research Involving Human Subjects of the University of Iowa. The subjects were screened one week prior to entry into the study. This included a physical examination, complete blood count, urinalysis, a pregnancy test (female subjects), SMA 6/60, SMA 12/60 (serum: total protein, albumin, calcium, inorganic phosphorus, cholesterol, glucose, urea nitrogen, uric acid, alkaline phosphatase, lactate dehydrogenase, total bilirubin, glutamate-oxaloacetate transaminase, sodium, potassium, chloride, carbon dioxide and creatinine). All subjects were requested to refrain from the ingestion of alcohol 24 hours prior to and 24 hours after administration of the test compounds.

The six subjects were studied in a Latin Square Design (13) using 3 different meal systems, including: (a) hamburger--milk shake meal alone; (b) hamburger--milk shake meal with MSG added to provide 150 mg/kg body weight; (c) hamburger--milk shake meal with MSG added to provide 150 mg/kg body weight and APM added to provide 23 mg/kg body weight. The composition of the test meal is shown in Table 1. The estimated intake of protein, aspartate, glutamate and phenylalanine are shown in Table 2.

The meal systems were administered at 0800 hours after an overnight fast (no food after 2200 hours). The subjects received nothing by mouth for the 8 hours following this load, except for water which was permitted ad libitum. Heparinized blood samples for plasma amino acid analyses were obtained at 0, 15, 30, 45, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes after ingestion of the meal. Blood samples were immediately centrifuged to separate plasma and erythrocytes, and the plasma was prepared for analyses as described previously (14). Amino acid analyses were carried out on automated amino acid analyzers (Beckman 121 M, Beckman Instruments, Palo Alto, California).

The aspartame was obtained from G. D. Searle. The monosodium L-glutamate was purchased as Accent[®] from a local grocery store.

Results

Plasma amino acid levels in all subjects studied are found in Appendix 1. Clinical data are found in Appendix 2. Results for amino acids of particular interest will be discussed in the following paragraphs.

The 1 gm/kg body weight load of protein resulted in increased levels of most plasma amino acids with peak values noted 4 to 6 hours after ingestion of the load. This is illustrated for valine in Table 3. The addition of MSG, or MSG plus aspartame had no effect upon the plasma valine levels.

Table 4 shows mean (\pm S.D.) plasma glutamate levels with time. Plasma glutamate levels increased from fasting values of 5.47 ± 2.16 umoles/dl to peak levels of 12.3 ± 3.47 umoles/dl after ingestion of the meal alone. The addition of MSG at 150 mg/kg body weight significantly increased plasma glutamate levels over levels noted after ingestion of the meal alone, with peak

values of 21.1 ± 8.6 umoles/dl noted. The addition of both aspartame (34 mg/kg) and MSG (150 mg/kg) to the meal increased plasma glutamate levels slightly above those noted after ingestion of the meal plus MSG, with mean peak levels of 23.0 ± 9.29 umoles/dl noted.

Similar changes were noted in plasma aspartate levels (Table 5). Mean plasma aspartate levels increased from fasting values of 0.38 ± 0.24 umoles/dl to values of 1.58 ± 0.67 umoles/dl after ingestion of the meal. The addition of MSG to the meal increased plasma aspartate levels above those noted after ingestion of the meal alone, with mean peak values of 2.49 ± 1.05 umoles/dl noted. The addition of both aspartame and MSG to the meal resulted in small but statistically significant increases in plasma aspartate levels beyond those noted after ingestion of the meal with MSG, reaching peak values of 3.65 ± 1.86 umoles/dl.

Plasma phenylalanine levels increased from fasting levels of 5.09 ± 0.44 umoles/dl to values of 9.75 ± 2.55 umoles/dl after ingestion of the meal alone (Table 6). The addition of MSG to the meal, had no significant effect upon plasma phenylalanine levels. However, the addition of both MSG and APM to the meal system did increase plasma phenylalanine levels slightly, with peak values of 10.2 ± 1.62 umoles/dl noted. While this difference is statistically significant, it's biological significance is not obvious.

The data in Table 7 show plasma glutamate plus aspartate levels in the subjects studied. Plasma glutamate plus aspartate levels increased from fasting levels of 5.86 ± 1.99 umoles/dl to mean peak values of 13.9 ± 3.45 umoles/dl after ingestion of the meal alone. The addition of MSG to the meal resulted in a significantly higher plasma glutamate plus aspartate levels, with peak values reaching 23.5 ± 9.44 umoles/dl after loading. However, the addition of APM plus MSG to the meal did not significantly increase plasma glutamate

plus aspartate levels beyond those resulting from the ingestion of the meal plus MSG alone. Mean peak plasma glutamate plus aspartate levels were only 26.4 ± 10.5 umoles/dl.

The data demonstrate that the addition of APM to meal systems containing large quantities of both free and protein-bound glutamate does not result in higher plasma glutamate plus aspartate levels than those noted after ingestion of the meal to which only glutamate was added.

Discussion

The quantities of MSG and APM administered in this study are considerable. According to the Committee on GRAS List Survey--Phase III (15), mean daily intake of MSG approximates only 100 to 225 mg for persons two years of age and over. These survey data (Table 8) indicate that the expected mean daily intake of MSG is 6.8 mg/kg body weight for the age group ingesting the largest quantity of MSG. This survey indicates a daily intake of 30 mg/kg body weight at the 90th percentile and an intake of 61 mg/kg at the 99.9th percentile for this age group. If we assume all this MSG is ingested over the course of 3 meals, an individual at the 99.9th percentile would ingest approximately 20 mg of added MSG per meal. In the present study, the level of MSG added was the Allowable Daily Intake (A.D.I.) set by the WHO/FAO (150 mg/kg body weight). In addition to this free glutamate, the protein of the meal provides approximately 171 mg/kg protein bound glutamate (includes glutamine) and 90 mg/kg protein-bound aspartate (includes asparagine). Thus, the total level of glutamate and aspartate ingested is considerable (Table 2).

The quantity of APM added to the meal (23 mg/kg body weight) was the quantity expected to be set as the A.D.I. for that compound (16). This is a

large dose, as can be seen by comparing this level with calculated ingestion levels found in Table 9. A typical 70 kg man has an energy requirement of about 2500 Kcal per day. Approximately 17 percent of this energy is ingested as sucrose (17). Thus, sucrose ingestion is about 1.5 g/kg/day. This is equivalent to 7.5 to 8.5 mg/kg aspartame, considering sweetening power to be 180 to 200 times that of sucrose.

If the total carbohydrate intake of our subject is assumed to be 50 percent of energy, about 313 g of carbohydrate would be ingested to supply this energy. If all this carbohydrate is ingested as sucrose, the subject would ingest 4.47 g/kg over the entire day. If the sweetening equivalent of this amount of sucrose were ingested as APM, the subject would ingest 23 to 25 mg/kg APM over the course of the entire day. In the present study, this level of APM was administered in a single dose.

Olney (5, 6) and Reif-Lehrer (7) have expressed concern that the aspartate content of APM might interact with MSG already present in the food system. Their concern was that such interaction would result in a competitive metabolism of glutamate and aspartate, markedly increasing plasma levels of these amino acids beyond those observed with glutamate alone. They associated these hypothetically increased plasma levels of glutamate and aspartate with increased potential for adverse effects. They based their concerns on the findings that large glutamate or aspartate loads given to infant mice produce a similar neuronal necrosis, and the effect of the glutamate and aspartate given together appeared to be additive (18).

However, neither the data from our previous studies of the interactions of aspartame and MSG ingested either as part of a hamburger-milk shake meal or as part

of a soup--beverage meal, nor the data from the present study support the concept that aspartame ingestion with MSG will increase plasma glutamate plus aspartate plasma levels at the doses studied.

In the present study, the ingestion of a high protein meal with MSG added at 150 mg/kg body weight increased plasma glutamate plus aspartate levels from normal fasting levels of 5.45 ± 2.73 umoles/dl to a mean (\pm S.D.) peak value of 23.5 ± 9.44 umoles/dl. The maximum value for plasma glutamate plus aspartate in one subject ingesting the meal with MSG was 35.3 umoles/dl. Despite the large quantity of APM administered, its addition to the meal containing MSG resulted in only a small increase in plasma glutamate plus aspartate levels. Mean peak glutamate plus aspartate levels were 26.4 ± 10.5 umoles/dl, a value not significantly greater than values noted after ingestion of the meal with glutamate alone (23.5 ± 9.44 umoles/dl). The maximum glutamate plus aspartate level in one subject ingesting the meal with MSG + aspartame was 35.4 umoles/dl.

These data agree well with data from previous studies showing the absence of an aspartame effect upon plasma glutamate plus aspartate levels when administered as part of a hamburger--milk shake meal, or as part of a soup--beverage meal (8, 9, 12). In the present study, the meal provided considerable quantities of endogenous protein-bound glutamate and aspartate as well as free glutamate. The protein meal provided 171 mg/kg protein-bound glutamate plus glutamine, and 90 mg/kg protein-bound aspartate plus asparagine. Free MSG was added to this at a level providing 150 mg/kg body weight. This meal system thus provides a considerable stress to body mechanisms for absorbing and metabolizing glutamate and aspartate. It would be expected that if any meal situation would show an aspartame effect upon

plasma glutamate plus aspartate levels, this system might be expected to do so. However, as noted by the data in Table 7, plasma glutamate plus aspartate levels were not significantly increased by the addition of APM to meal systems already providing MSG at 150 mg/kg body weight. Thus, the addition of APM to the food supply will not significantly increase plasma glutamate plus aspartate levels above those levels that result from ingestion of glutamate alone.

The potential toxicity of grossly elevated plasma glutamate and aspartate levels is controversial. There is no doubt that administration of large doses of aspartate and glutamate to the young rodent produces markedly elevated plasma levels of these amino acids (19, 20), and hypothalamic neuronal necrosis (21, 22). However, results of studies in the neonatal non-human primate differ. Olney and colleagues report that high doses of glutamate given to neonatal non-human primates cause neuronal necrosis (23, 24). Four other laboratories, however, have been unable to repeat these findings (25-30) even in the presence of grossly elevated plasma glutamate plus aspartate levels. For example, we were unable to detect neuronal necrosis in infant monkeys given large doses of MSG, where plasma glutamate plus aspartate levels exceeded 500 umoles/dl (30).

In addition, Reynolds et al. (31) have demonstrated that aspartame administered at 2 gm/kg body weight to neonatal primates does not result in neuronal damage. Furthermore, they have also demonstrated that administration of aspartame at 2 gm/kg body weight with MSG at 1 gm/kg body weight does not produce neuronal necrosis in infant non-human primates (32). Thus, the concerns of Olney (5, 6) and Reif-Lehrer (7) seem to be without scientific

foundation.

The aspartame dose provides approximately 12.7 mg phenylalanine/kg body weight, in addition to the 43 mg/kg provided by the protein. As shown in Table 6, the addition of aspartame did increase plasma phenylalanine levels slightly above levels noted after ingestion of the meal with MSG alone, but not above levels noted after ingestion of the meal alone. This difference apparently reflects meal to meal variations. In any case, the peak plasma phenylalanine levels observed (10.7 ± 2.28 umoles/dl) are well within the normal postprandial range noted in normal, orally-fed human infant and adult subjects (33, 34).

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TABLES

Table 1
COMPOSITION OF TEST MEAL FOR A 70 KG ADULT

Component	Quantity gm	Protein gm	Fat gm	CHO gm	Energy kcal
Hamburger	222	61	25.5	0	346
Bun	50	4.5	1.5	25.5	133.5
Milk	100	3.5	3.5	5	65.5
Ice Cream	50	1	2.5	5.5	48.5
Total	422	70	33	36	594

Protein - 41% of total energy

For the 70 Kg person, the meal supplies about 1 gm/kg body weight as protein. The hamburger content of the meal was varied with each individual so as to provide protein at 1 gm/kg body weight.

Table 2
ESTIMATED INTAKE OF PROTEIN, ASPARTIC ACID
GLUTAMIC ACID AND PHENYLALANINE ON MEAL STUDIES

Study	Protein g/kg	Aspartate mg/kg	Glutamate mg/kg	Phenylalanine mg/kg
Hamburger- Shake	1.0	90	171	43
Hamburger- Shake with MSG	1.0	90	288*	43
Hamburger- Shake with APM & MSG	1.0	103	288*	56

* Corrected for the sodium content and water of hydration of MSG
 (78% of MSG is glutamate).

Table 3

MEAN (\pm S.D.) PLASMA VALINE LEVELS (μ moles/dl) IN NORMAL ADULTS INGESTING
MEAL WITH AND WITHOUT ADDED MSG AND MSG PLUS ASPARTAME

TIME (Hrs)	MEAL ALONE	MEAL + MSG	MEAL + MSG + APM
0	24.6 \pm 4.1	26.6 \pm 10.7	23.4 \pm 7.1
0.25	27.0 \pm 5.0	29.2 \pm 5.9	33.3 \pm 9.1
0.50	32.4 \pm 7.1	35.5 \pm 10.0	31.9 \pm 8.1
0.75	35.6 \pm 8.0	34.9 \pm 9.5	31.6 \pm 9.9
1.0	37.5 \pm 8.2	37.7 \pm 10.7	37.2 \pm 9.5
1.5	42.9 \pm 7.7	41.3 \pm 10.3	37.1 \pm 12.2
2.0	49.0 \pm 8.1	45.3 \pm 8.9	41.7 \pm 12.9
2.5	51.3 \pm 8.3	49.4 \pm 9.7	47.3 \pm 11.9
3.0	53.5 \pm 8.7	47.3 \pm 5.7	49.0 \pm 10.7
4.0	52.0 \pm 8.3	57.9 \pm 9.5	46.1 \pm 18.1
5.0	42.3 \pm 12.0	48.8 \pm 14.5	48.5 \pm 9.7
6.0	39.7 \pm 7.0	38.4 \pm 4.1	43.6 \pm 6.8
7.0	36.0 \pm 2.2	39.3 \pm 8.9	38.2 \pm 4.1
8.0	24.2 \pm 3.3	36.8 \pm 8.4	33.6 \pm 5.6

Table 4

MEAN (\pm S.D.) PLASMA GLUTAMATE LEVELS (μ moles/dl) IN NORMAL ADULTS INGESTING MEALS WITH AND WITHOUT ADDED MSG AND MSG PLUS ASPARTAME

Time (Hrs)	MEAL ALONE	MEAL + MSG	MEAL + MSG & APM	p between MSG & MSG & APM
0	5.47 \pm 2.16	5.12 \pm 2.61	4.87 \pm 2.17	NS ^a
0.25	8.22 \pm 1.95	10.2 \pm 4.00	10.9 \pm 7.90	NS
0.50	8.59 \pm 1.45	19.2 \pm 9.68	17.2 \pm 6.98	NS
0.75	8.66 \pm 2.77	21.1 \pm 8.60	19.6 \pm 8.34	NS
1.0	9.48 \pm 2.59	18.2 \pm 4.64	23.0 \pm 9.29	NS
1.5	10.4 \pm 3.51	17.5 \pm 3.89	20.0 \pm 7.57	NS
2.0	12.3 \pm 3.47	16.3 \pm 5.20	19.0 \pm 4.90	NS
2.5	12.2 \pm 4.09	15.9 \pm 2.82	16.7 \pm 4.45	NS
3.0	11.4 \pm 3.11	11.3 \pm 2.14	15.8 \pm 3.88	NS
4.0	8.73 \pm 3.47	10.7 \pm 2.22	12.3 \pm 8.26	NS
5.0	7.66 \pm 2.23	9.55 \pm 2.21	11.2 \pm 4.49	NS
6.0	4.72 \pm 2.37	6.15 \pm 1.17	7.36 \pm 3.06	NS
7.0	4.58 \pm 1.68	5.57 \pm 2.17	5.55 \pm 1.79	NS
8.0	4.91 \pm 2.40	5.72 \pm 2.05	4.95 \pm 2.29	NS

^aNS = not significant (paired t test) at p = 0.05 or less

Table 5

MEAN (\pm S.D.) PLASMA ASPARTATE LEVELS IN NORMAL SUBJECTS INGESTING MEALS
WITH AND WITHOUT MSG OR MSG PLUS ASPARTAME

TIME (Hrs)	MEAL ALONE	MEAL + MSG	MEAL + MSG & APM	p between MSG and MSG + APM
0	0.38 \pm 0.24 ^a	0.50 \pm 0.22 ^a	0.54 \pm 0.25 ^a	NS ^b
0.25	0.61 \pm 0.36	0.90 \pm 0.38	1.44 \pm 1.07	NS
0.50	0.86 \pm 0.44	2.15 \pm 0.96	2.41 \pm 1.26	NS
0.75	0.73 \pm 0.43	2.44 \pm 0.99	2.82 \pm 1.41	NS
1.0	0.80 \pm 0.37	2.27 \pm 0.84	3.65 \pm 1.86	NS
1.5	1.16 \pm 0.62	2.48 \pm 1.05	3.25 \pm 1.41	0.05
2.0	1.55 \pm 0.59	2.25 \pm 1.05	3.44 \pm 1.91	NS
2.5	1.58 \pm 0.67	2.52 \pm 0.66	2.82 \pm 1.61	NS
3.0	1.55 \pm 0.65	1.72 \pm 0.54	3.06 \pm 1.39	0.05
4.0	1.04 \pm 0.58	1.60 \pm 0.22	2.15 \pm 1.48	NS
5.0	0.83 \pm 0.47	0.89 \pm 0.19	1.78 \pm 0.58	0.02
6.0	0.57 \pm 0.34	0.49 \pm 0.19	0.90 \pm 0.37	NS
7.0	0.53 \pm 0.32	0.53 \pm 0.36	0.60 \pm 0.18	NS
8.0	0.51 \pm 0.30	0.39 \pm 0.18	0.41 \pm 0.19	NS

^aData expressed as umoles/dl

^bNS = not significant (paired t test) at p = 0.05 or less

Table 6

PLASMA PHENYLALANINE LEVELS ($\mu\text{moles/dl}$) IN NORMAL ADULTS INGESTING MEALS
WITH AND WITHOUT ADDED MSG AND MSG PLUS ASPARTAME

TIME (Hrs)	MEAL ALONE	MEAL + MSG	MEAL + MSG & APM	p between MSG & MSG + APM
0	5.09 \pm 0.44 ^a	5.24 \pm 0.66 ^a	5.32 \pm 0.93 ^a	NS ^b
0.25	6.58 \pm 1.29	5.83 \pm 1.05	9.35 \pm 2.90	0.03
0.50	7.25 \pm 1.09	7.58 \pm 2.06	9.78 \pm 1.65	NS
0.75	7.96 \pm 1.48	6.99 \pm 1.87	9.06 \pm 1.37	0.03
1.0	8.39 \pm 2.08	7.73 \pm 2.02	10.2 \pm 1.62	NS
1.5	8.61 \pm 1.59	8.49 \pm 1.36	9.96 \pm 1.99	NS
2.0	9.66 \pm 2.54	7.90 \pm 0.60	10.2 \pm 2.61	NS
2.5	9.75 \pm 2.55	8.24 \pm 1.32	10.6 \pm 2.35	0.03
3.0	9.15 \pm 1.67	8.25 \pm 0.29	10.7 \pm 2.28	0.03
4.0	8.64 \pm 2.39	8.95 \pm 1.12	9.52 \pm 3.68	NS
5.0	6.74 \pm 0.85	6.91 \pm 2.32	9.09 \pm 1.52	NS
6.0	5.65 \pm 1.72	5.38 \pm 0.85	7.38 \pm 1.30	0.01
7.0	5.34 \pm 0.57	5.59 \pm 1.42	5.98 \pm 1.22	NS
8.0	5.37 \pm 0.36	5.25 \pm 0.67	5.54 \pm 0.47	NS

^aData expressed as mean \pm S.D.

^bNS = not significant (paired t test) at p = 0.05 or less

Table 7

PLASMA GLUTAMATE PLUS ASPARTATE LEVELS ($\mu\text{moles/dl}$) IN NORMAL ADULTS INGESTING MEALS WITH AND WITHOUT ADDED MSG AND ASPARTAME

<u>TIME (Hrs)</u>	<u>MEAL ALONE</u>	<u>MEAL + MSG</u>	<u>MEAL + MSG & APM</u>	<u>p between MSG & MSG + APM</u>
0	5.86 \pm 1.99 ^a	5.45 \pm 2.73 ^a	5.58 \pm 2.08 ^a	NS
0.25	9.00 \pm 1.99	10.9 \pm 4.03	12.1 \pm 8.97	NS
0.50	9.29 \pm 1.64	21.4 \pm 10.5	19.8 \pm 8.18	NS
0.75	9.22 \pm 2.98	23.5 \pm 9.44	22.4 \pm 9.56	NS
1.0	10.3 \pm 2.64	20.5 \pm 5.26	26.4 \pm 10.5	NS
1.5	11.6 \pm 3.61	19.7 \pm 4.32	23.3 \pm 8.73	NS
2.0	13.9 \pm 3.45	18.6 \pm 6.07	22.5 \pm 6.44	NS
2.5	13.8 \pm 4.09	18.4 \pm 3.04	19.6 \pm 5.83	NS
3.0	13.0 \pm 3.06	13.0 \pm 2.53	18.8 \pm 4.91	NS
4.0	9.77 \pm 3.47	12.3 \pm 2.31	14.6 \pm 9.31	NS
5.0	8.48 \pm 3.33	9.88 \pm 2.22	11.8 \pm 4.64	NS
6.0	5.29 \pm 2.20	6.44 \pm 1.28	8.26 \pm 3.24	NS
7.0	5.11 \pm 1.76	6.11 \pm 2.48	6.15 \pm 1.74	NS
8.0	5.42 \pm 2.18	6.10 \pm 2.18	5.37 \pm 2.29	NS

^aData expressed as mean \pm S.D.; individual data shown on next page

^bNS = not significant (paired t test) at p = 0.05 or less

Table 7 (cont.)

Plasma Glutamate Plus Aspartate Levels In Normal Adults Ingesting A Hamberger--Milk Shake Meal And Without Added MSG and Aspartame.

Subject	<u>0</u>	<u>0.25</u>	<u>0.50</u>	<u>0.75</u>	<u>1.00</u>	<u>1.50</u>	<u>2.00</u>	<u>2.50</u>	<u>3.00</u>	<u>4.00</u>	<u>5.00</u>	<u>6.00</u>	<u>7.00</u>
<u>MEAL ALONE</u>													
S.H.	3.93	7.19	8.36	8.74	7.90	8.67	11.2	9.06	7.65	3.51	3.49	2.73	2.73
K.G.	9.43	11.8	12.8	14.7	14.8	17.9	21.1	21.3	16.9	13.9	12.0	5.39	6.44
S.G.	4.87	8.03	9.34	10.4	12.1	12.8	13.2	12.6	12.5	10.6	11.1	6.54	7.97
CMC	7.60	9.78	7.89	5.33	7.91	6.41	11.0	12.4	12.2	7.20	4.79	2.78	3.49
G.I.	5.03	9.91	8.98	9.48	11.2	12.7	14.5	16.6	16.3	12.5	8.10	9.11	6.44
J.S.	4.28	6.29	8.36	6.67	7.84	10.9	12.2	10.6	12.2	10.9	11.4	5.19	5.19
MEAN	5.86	9.00	9.29	9.22	10.3	11.6	13.9	13.8	13.0	9.77	8.48	5.29	5.29
S.D.	1.99	1.99	1.64	2.98	2.64	3.61	3.45	4.09	3.06	3.47	3.33	2.20	1.99
<u>MEAL + MSG (150 mg/kg body weight)</u>													
S.H.	2.58	11.1	23.8	24.7	24.9	20.9	20.2	18.2	11.5	12.6	11.2	6.44	10.2
K.G.	10.3	16.9	24.4	28.2	23.7	24.4	17.6	19.8	12.0	12.7	9.75	5.37	6.44
S.G.	6.39	11.6	35.0	35.3	22.0	20.2	29.7	20.6	16.7	15.4	14.4	7.49	6.44
CMC	5.04	7.21	12.0	20.1	22.7	23.1	17.0	20.8	15.4	8.73	7.97	6.54	4.79
G.I.	3.38	5.71	6.07	7.19	10.5	12.6	12.6	18.3	12.4	13.6	10.9	8.68	5.19
J.S.	5.03	13.0	27.0	25.8	19.1	16.9	14.2	12.6	10.0	10.7	8.44	5.35	3.49
MEAN	5.45	10.9	21.4	23.5	20.5	19.7	18.6	18.4	13.0	12.3	9.88	6.44	6.44
S.D.	2.73	4.03	10.5	9.44	5.26	4.32	6.07	3.04	2.53	2.31	2.22	1.28	2.73
<u>MEAL + MSG (150 mg/kg) and APM (23 mg/kg).</u>													
S.H.	4.67	9.30	22.5	22.1	19.8	17.8	20.4	19.4	14.1	7.56	8.84	6.56	5.19
K.G.	8.56	30.4	30.2	30.6	31.6	35.0	26.6	20.6	22.1	31.4	22.4	14.0	9.75
S.G.	3.79	7.78	24.8	32.2	35.4	29.0	19.8	13.5	12.0	13.0	9.89	10.2	5.19
CMC	7.26	7.88	21.2	22.7	25.5	28.3	33.6	30.2	25.1	19.1	11.6	5.84	6.44
G.I.	3.19	9.96	8.60	5.29	9.14	12.4	18.2	18.2	19.8	9.02	12.7	7.17	5.19
J.S.	6.04	7.71	11.6	21.4	36.7	17.1	16.4	15.4	19.8	7.59	12.3	5.81	4.79
MEAN	5.58	12.2	19.8	22.4	26.4	23.3	22.5	19.6	18.8	14.6	11.8	8.26	6.44
S.D.	2.08	8.97	8.18	9.56	10.5	8.73	6.44	5.83	4.91	9.31	4.64	3.24	1.99

data expressed as mean \pm S.D. in umoles/dl

Table 8
EXPECTED DAILY INTAKE OF MONOSODIUM GLUTAMATE
BASED ON PERSON-DAYS
(Means and Percentiles by Age)†

Age	Total Sample			
	Intakes, mg/kg/day			
	Mean	90th PCTL	99th PCTL	99.9th PCTL
0-5 months	0.3	0	11	25
6-11 months	1.9	1.9	36	46
12-23 months	6.8	30	43	61
2-5 years	5.5	23	37	56
6-17 years	2.7	10	25	40
18+ years	1.5	7	12	19

† Reference 15

Table 9

ESTIMATE OF ASPARTAME INTAKE IN A 70 KG MAN
WITH AN ENERGY REQUIREMENT OF 2500 KCAL PER DAY

A. Sucrose Intake as 17% of Energy

<u>Kcalories</u>	<u>Sucrose</u>	<u>Sucrose Intake</u>	<u>Aspartame Equivalent</u>
425	104 g	1500 mg/kg	7.5-8.5 mg/kg

B. Total Carbohydrate Intake as 50% of Energy

<u>Kcalories</u>	<u>Carbohydrate</u>	<u>Sucrose Equivalent</u>	<u>Aspartame Equivalent</u>
1250	313 g	4,470 mg/kg	23-25 mg/kg

025

APPENDIX I

MEAL STUDY

AMINO ACID LEVELS UMOL/100ML

PLASMA AMINO ACID 191 ALANINE

DIET=MEAL DOSE=0 MG/KG

SUBJECT	DATE	WEIGHT	TIME																
			0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24
CNC		30279	27.90	43.70	43.70	54.12	40.50	47.10	41.10	41.70	40.00	40.90	42.30	32.00	22.60	20.90			
GI		41279	47.80	55.60	44.10	59.90	76.10	78.00	69.00	69.60	68.40	58.00	34.20	42.50	34.10	30.20			
JS		50179	25.40	30.20	34.60	39.00	30.90	38.50	42.60	37.10	35.00	32.20	27.00	25.20	22.50	20.60			
KG		51079	52.40	63.20	72.00	82.00	75.00	63.00	61.60	59.20	56.00	42.50	37.20	36.30	29.40	27.40			
SG		50079	22.40	21.20	32.60	34.10	33.30	36.00	34.40	30.00	32.00	31.50	25.00	25.50	22.00	20.00			
SH		50079	31.30	30.70	39.40	40.10	50.20	53.90	40.30	47.60	40.70	44.00	32.30	27.90	25.70	20.00			
MEAN			34.53	40.77	44.55	52.07	53.07	52.00	40.05	47.53	46.60	41.65	33.13	31.70	26.15	20.12			
SD			12.493	16.296	14.640	17.120	10.055	15.704	13.411	14.652	13.051	9.704	6.277	6.043	4.746	4.402			
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6			

DIET=MEAL MSG DOSE=190 MG/KG

SUBJECT	DATE	WEIGHT		TIME																
		0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR	
CNC		41979	27.10	30.60	47.20	57.50	63.70	64.30	50.70	40.00	42.90	39.90	18.40	24.30	20.10	23.90				
GI		41979	37.30	41.00	46.10	57.70	70.00	65.50	61.60	40.40	55.20	47.30	35.20	24.20	31.90	25.10				
JS		50079	36.50	47.00	52.60	52.00	53.10	53.00	42.20	41.00	44.00	42.00	32.10	26.60	24.50	23.00				
KG		41379	49.00	50.70	56.60	61.20	59.50	52.70	49.40	43.60	52.00	45.90	40.50	36.70	31.70	32.60				
SG		41279	26.00	25.30	41.90	20.10	34.10	33.00	47.70	34.30	31.40	43.20	35.60	23.00	21.10	20.00				
SH		51779	55.50	40.20	72.70	79.10	82.60	76.40	59.50	73.10	67.70	60.40	50.00	40.40	00.00	42.00				
MEAN			30.70	41.23	52.85	55.93	60.47	57.92	51.05	40.53	47.40	40.45	35.43	29.33	31.30	27.77				
SD			11.900	10.097	11.005	10.493	10.303	14.700	7.360	13.118	9.790	8.600	10.613	7.301	10.053	8.137				
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6				

DIET=MEAL MSG APM DOSE=150 MG/KG

	SUBJECT	DATE	WEIGHT		TIME															
			0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	
CNC			51679	•	43.00	50.30	71.70	74.90	72.00	70.40	60.00	56.00	50.90	52.60	39.70	36.40	31.40	26.90	•	
GI			50079	•	40.60	74.40	70.10	60.60	60.70	62.00	61.40	64.60	64.30	48.90	41.70	36.10	23.80	20.20	•	
JS			42479	•	23.90	30.20	24.00	39.00	46.50	52.00	40.60	38.90	21.60	32.20	29.10	20.00	27.10	•	•	
KG			50179	•	39.20	60.50	70.10	80.00	89.30	67.20	53.20	61.00	57.00	34.30	25.90	26.00	•	•	•	
SG			41979	•	32.30	29.00	35.40	39.10	40.60	45.40	38.00	47.70	47.50	40.90	33.70	20.60	20.00	•	•	
SH			41279	•	30.70	31.92	47.00	49.40	55.50	51.30	43.40	47.00	41.20	36.10	29.30	20.40	20.00	•	•	
MEAN					36.42	47.38	53.32	57.17	50.27	57.13	52.47	62.55	51.45	43.00	36.63	32.15	20.42	20.30	•	
SD					0.132	20.204	20.327	17.600	17.000	10.024	0.507	0.925	10.396	13.107	0.661	0.054	0.200	0.000	•	
N					6	6	6	6	6	6	6	6	6	6	6	6	6	6	•	

MEAL STUDY

AMINO ACID LEVELS UMOL/L/100ML

PLASMA AMINO ACID 150 ARGININE

DIET=MEAL DOSE=0 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	30279	.	7.32	11.20	19.70	13.50	12.00	12.20	14.20	16.10	15.93	14.90	11.50	7.96	3.07	7.30	.	.
GI	41279	.	10.60	15.90	10.50	20.90	10.60	20.20	20.00	19.20	10.30	12.50	10.70	11.50	12.50	11.50	.	.
JS	50179	.	7.91	0.00	11.90	9.97	10.70	13.00	17.50	17.00	14.30	14.60	12.10	9.40	7.12	6.55	.	.
KC	51079	.	6.22	10.30	20.60	17.30	16.90	13.00	10.00	17.00	16.90	14.60	10.50	7.00	2.27	5.42	.	.
SC	50079	.	7.63	9.40	12.40	12.10	13.30	15.00	10.20	10.50	17.70	10.60	7.92	10.00	0.00	7.40	.	.
SM	50079	.	0.26	10.50	15.30	10.60	17.60	10.20	22.20	17.40	16.30	13.90	9.40	7.70	7.70	7.50	.	.
MEAN			7.07	12.34	14.57	15.06	14.05	16.04	10.40	17.60	10.57	14.52	10.56	9.00	6.97	7.66	.	.
SD			1.500	3.857	3.672	3.905	3.273	3.232	2.609	1.102	1.410	1.330	1.400	1.005	3.022	2.040	.	.
N			6	6	6	6	6	5	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	41979	.	6.94	0.00	12.20	13.20	14.00	13.60	11.40	13.10	11.00	11.20	9.75	6.16	6.26	6.54	.	.
GI	41979	.	12.40	12.60	14.40	15.50	10.00	21.40	20.50	19.00	17.30	21.70	15.60	13.20	9.29	7.30	.	.
JS	50079	.	6.93	0.50	7.62	7.37	6.00	7.70	11.50	13.50	13.70	14.90	9.65	6.36	6.30	5.53	.	.
KC	41379	.	9.63	9.50	10.50	11.00	11.50	12.60	12.90	12.00	13.70	12.50	9.50	10.10	0.60	0.45	.	.
SC	41279	.	7.13	12.00	14.10	9.36	10.20	16.20	25.10	24.60	16.90	21.20	19.10	0.51	6.95	5.66	.	.
SM	51779	.	12.50	16.10	16.60	17.70	10.90	22.00	25.00	20.90	13.40	20.50	10.90	7.70	12.60	10.70	.	.
MEAN			9.25	11.26	12.54	12.55	13.40	15.50	17.07	17.52	14.47	17.00	13.43	8.60	7.00	7.30	.	.
SD			8.077	2.903	3.216	3.060	5.890	0.404	0.771	4.920	2.162	4.605	4.270	2.640	2.630	1.962	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG APH DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	51679	.	0.67	0.92	15.40	13.40	14.60	15.50	17.90	10.10	17.60	10.70	12.20	0.30	7.37	5.97	.	.
GI	50079	.	9.36	17.20	15.90	12.30	12.70	14.30	23.90	26.20	12.30	10.20	19.70	11.70	7.22	0.52	.	.
JS	42079	.	6.40	15.10	7.07	0.02	11.00	11.10	12.10	12.50	13.60	6.34	10.50	7.95	6.70	0.70	.	.
KC	50179	.	0.10	15.40	16.00	10.40	21.30	23.00	21.10	22.40	20.70	23.10	17.90	12.60	0.60	0.41	.	.
SC	41079	.	0.73	0.70	10.20	10.00	12.70	12.70	14.20	17.70	10.90	10.50	16.50	14.00	10.50	10.40	.	.
SM	41279	.	11.70	15.20	15.40	14.90	15.10	10.20	21.40	22.50	10.70	12.20	12.30	0.64	0.54	11.00	.	.
MEAN			9.01	13.43	13.56	13.00	14.70	15.00	10.43	19.40	17.13	16.51	14.05	10.05	0.34	0.01	.	.
SD			1.007	3.630	3.707	3.975	3.460	4.201	4.563	0.220	3.420	6.441	3.600	2.050	1.476	2.202	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

0

0

0

0

0

0

0

0

MEAL STUDY

AMINO ACID LEVELS UNOL/100ML

PLASMA AMINO ACID 131 ASPARTATE

DIET=MEAL DOSE=0 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	30279	.	0.42	0.57	0.71	0.51	0.56	0.57	1.35	1.40	1.53	0.65	0.49	0.60	0.60	0.60	0.34	.	.	.
GI	41279	.	0.27	0.33	0.73	0.47	0.60	0.06	0.02	1.03	1.04	0.90	0.39	0.40	0.40	0.30	0.77	.	.	.
JS	50179	.	0.15	0.34	0.40	0.34	0.55	0.97	1.45	1.30	1.60	1.25	1.29	0.54	0.45	0.45	0.21	.	.	.
KG	51679	.	0.30	0.90	1.52	1.12	1.17	1.04	2.27	2.64	2.13	1.11	1.22	0.20	0.20	0.20	0.41	.	.	.
SG	50079	.	0.03	1.19	1.29	1.41	1.37	2.03	2.26	2.12	2.31	2.00	1.25	1.20	1.14	0.99	0.99	.	.	.
SH	50079	.	0.26	0.33	0.54	0.55	0.56	0.70	1.03	0.92	0.59	0.20	0.34	0.41	0.44	0.34	.	.	.	.
MEAN			0.30	0.61	0.66	0.73	0.60	1.16	1.55	1.50	1.55	1.04	0.63	0.60	0.57	0.53	0.51	.	.	.
SD			0.230	0.361	0.441	0.420	0.369	0.617	0.590	0.667	0.650	0.504	0.407	0.337	0.323	0.302	.	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	41979	.	0.07	0.73	2.06	3.10	3.48	3.07	2.02	3.70	2.63	1.61	0.64	0.57	0.55	0.55	0.39	.	.	.
GI	41979	.	0.20	0.35	0.39	0.60	0.85	1.20	1.22	2.19	1.37	1.70	1.12	0.74	0.40	0.37	0.37	.	.	.
JS	50879	.	0.35	1.13	2.03	2.36	2.31	1.61	1.90	2.25	1.56	1.45	0.95	0.59	0.27	0.32	0.32	.	.	.
KG	41379	.	0.63	1.41	2.51	2.97	2.27	2.42	1.20	2.24	1.24	1.26	0.75	0.20	0.31	0.27	0.27	.	.	.
SG	41279	.	0.45	1.10	3.60	3.30	2.47	3.35	3.05	2.68	2.13	1.90	1.00	0.40	0.35	0.25	0.25	.	.	.
SH	51779	.	0.40	0.60	2.04	2.34	2.25	2.29	2.41	1.96	1.39	1.63	0.79	0.30	1.24	0.73	0.73	.	.	.
MEAN			0.50	0.90	2.15	2.44	2.27	2.40	2.25	2.52	1.72	1.60	0.80	0.40	0.53	0.39	0.39	.	.	.
SD			0.210	0.303	0.937	0.906	0.830	1.040	1.051	0.661	0.545	0.220	0.194	0.107	0.302	0.170	0.170	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.

DIET=MEAL MSG APM DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	51079	.	0.09	1.04	3.39	4.10	4.66	5.13	7.21	5.96	5.00	4.30	1.96	0.07	0.04	0.62	.	.	.	
GI	50079	.	0.34	0.59	0.42	0.36	0.59	1.12	1.72	1.64	3.03	1.29	1.95	0.62	0.40	0.31	.	.	.	
JS	42479	.	0.02	1.09	1.44	2.77	6.03	2.00	2.65	2.60	3.32	0.94	2.23	0.97	0.70	0.67	.	.	.	
KG	50179	.	0.40	3.40	3.36	3.58	3.04	4.00	3.10	2.23	2.33	3.70	2.33	1.00	0.40	0.36	.	.	.	
SG	41979	.	0.32	0.00	3.49	3.94	4.16	3.96	3.71	1.66	1.02	1.40	1.40	1.47	0.52	0.22	.	.	.	
SH	41279	.	0.50	1.02	2.36	2.16	2.04	2.40	3.02	2.77	2.03	0.06	0.76	0.42	0.50	0.20	.	.	.	
MEAN			0.54	1.44	2.41	2.62	3.05	3.25	3.44	2.82	3.00	2.15	1.70	0.91	0.60	0.41	.	.	.	
SD			0.240	1.067	1.260	1.411	1.064	1.400	1.013	1.611	1.300	1.403	0.503	0.300	0.175	0.107	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	

MEAL STUDY

PLASMA AMINO ACID 161 CITRULLINE

DIET=MEAL DOSE=0 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	30279	.	10.58	15.16	18.98	9.35	8.38	8.47	10.28	14.08	14.28	14.58	12.90	9.64	6.63	12.38	.	.	.	.
GI	41279	.	6.65	4.56	2.72	3.16	5.58	2.41	3.39	3.93	5.16	3.46	5.16	5.84	3.92	4.19	.	.	.	.
JS	50179	.	1.59	2.02	2.23	2.23	2.01	1.94	1.81	3.83	2.83	3.76	3.83	2.98	2.48	2.57	.	.	.	.
KG	51679	.	2.65	2.41	2.16	2.33	2.17	2.79	3.31	3.99	5.12	4.13	3.65	2.79	2.09	3.16	.	.	.	.
SG	50879	.	2.78	2.58	2.97	2.38	2.58	3.13	3.60	4.35	4.69	5.31	2.29	3.87	2.87	2.78	.	.	.	.
SH	50879	.	3.77	3.91	2.64	3.55	3.27	3.72	5.53	5.44	6.86	5.98	4.42	3.43	2.88	3.33	.	.	.	.
MEAN			4.55	5.88	3.94	3.82	3.98	3.74	4.65	5.79	6.34	6.18	5.37	4.58	3.58	4.72	.	.	.	.
SD			3.201	5.884	3.425	2.762	2.582	2.394	2.965	4.897	3.995	4.184	3.887	2.815	1.574	3.754	.	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG DOSE=158 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	41979	.	2.88	2.47	2.72	1.88	2.39	2.66	2.68	3.42	3.86	2.95	3.16	2.57	2.32	2.77	.	.	.	
GI	41979	.	3.55	2.73	2.84	1.55	2.15	1.93	2.76	3.22	3.36	4.51	4.48	3.29	3.34	3.37	.	.	.	
JS	50879	.	1.64	1.22	1.66	1.04	0.97	1.09	1.08	1.75	2.74	3.04	2.91	2.34	2.81	1.78	.	.	.	
KG	41379	.	3.97	1.98	1.76	1.58	1.82	2.59	2.84	3.22	3.77	4.38	4.21	1.83	2.68	2.95	.	.	.	
SG	41279	.	2.68	1.88	2.88	1.47	1.39	1.88	5.85	5.88	3.27	7.31	6.48	2.38	2.85	1.98	.	.	.	
SH	51779	.	5.63	4.78	4.56	4.15	3.87	4.59	4.88	6.66	6.83	8.87	7.37	6.32	7.32	8.67	.	.	.	
MEAN			3.38	2.46	2.59	1.94	2.18	2.44	3.19	3.88	3.84	5.38	4.75	2.97	3.29	3.23	.	.	.	
SD			1.378	1.258	1.877	1.115	1.888	1.199	1.494	1.789	1.585	2.283	1.799	1.794	2.838	1.883	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG APM DOSE=158 MG/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	51679	.		4.38	3.24	3.88	2.24	2.88	2.86	3.92	4.41	4.68	5.39	4.48	3.59	3.68	3.42	.	.	.	
GI	50879	.		3.84	5.71	4.73	2.13	2.89	1.47	2.14	3.21	3.83	2.87	4.86	4.83	3.53	3.39	.	.	.	
JS	42479	.		2.82	5.31	2.44	2.18	2.68	2.35	2.89	3.24	3.83	2.84	4.39	2.99	3.28	2.38	.	.	.	
KG	58179	.		3.88	3.17	2.81	2.43	2.34	3.83	3.21	4.24	3.98	5.36	3.43	4.57	3.22	3.57	.	.	.	
SG	41879	.		2.28	1.89	1.35	1.41	2.34	1.63	1.96	2.15	2.56	3.32	3.67	3.81	3.81	2.88	.	.	.	
SH	41279	.		5.23	3.98	3.32	3.48	3.59	3.97	4.84	6.83	8.41	5.78	6.23	8.76	5.88	4.14	.	.	.	
MEAN				3.43	3.87	2.94	2.31	2.51	2.55	3.18	3.88	3.88	4.11	4.84	4.26	3.59	3.28	.	.	.	
SD				1.115	1.433	1.188	0.674	0.565	0.938	1.891	1.333	1.832	1.568	0.892	0.894	0.723	0.816	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

MEAL STUDY

AMINOGRAMS
AMINO ACID LEVELS UMOL/L/100ML

3:23 WEDNESDAY, JULY 25, 1970 13

PLASMA AMINO ACID ISI GLUTAMATE

DIET=MEAL MSG DOSE=0 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	30279	.	7.10	0.21	7.16	5.02	7.35	5.84	9.62	11.00	10.70	6.55	4.30	2.10	2.23	3.31	.	.
GI	41279	.	4.76	9.50	0.25	9.01	10.60	11.00	13.60	15.60	15.30	11.50	7.71	0.65	0.81	0.04	.	.
JS	50179	.	4.13	5.95	7.06	6.33	7.20	9.00	10.70	9.10	10.50	9.60	10.10	4.60	4.97	3.23	.	.
KC	51679	.	9.05	10.90	11.30	13.00	13.60	16.10	10.00	10.70	14.00	12.00	10.00	5.10	6.10	0.01	.	.
SG	50079	.	4.04	6.04	9.05	8.90	10.70	10.00	10.00	10.50	10.20	0.50	9.00	0.34	6.05	5.15	.	.
SH	50079	.	3.67	6.06	7.02	0.19	7.34	7.97	10.20	0.14	7.06	3.23	3.15	2.32	3.04	2.27	.	.
MEAN			5.47	8.22	8.59	0.65	9.40	10.40	12.20	12.10	11.43	8.72	7.66	4.72	4.71	4.00	.	.
SD			2.100	1.945	1.459	2.709	2.593	3.509	3.477	4.003	3.109	3.469	3.236	2.371	1.600	2.401	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	41079	.	5.17	6.40	9.97	17.00	10.20	19.20	14.20	17.00	12.00	7.12	7.33	0.97	4.11	0.03	.	.
GI	41079	.	3.10	5.30	5.60	6.59	9.62	11.40	11.40	16.30	11.00	11.00	9.00	7.94	0.20	4.90	.	.
JS	50079	.	4.60	11.90	24.20	23.30	16.00	15.30	12.30	10.30	0.47	9.22	7.40	4.75	3.07	3.21	.	.
KC	41379	.	9.65	16.50	21.90	25.20	21.40	22.00	16.40	17.00	10.00	11.40	9.00	5.17	5.02	0.91	.	.
SG	41279	.	5.04	10.50	31.90	32.00	19.50	16.60	25.70	17.90	14.60	13.50	13.30	7.00	5.73	0.02	.	.
SH	51779	.	2.10	10.40	21.00	22.40	22.60	20.60	17.00	16.20	10.10	11.00	10.40	6.00	9.43	0.15	.	.
MEAN			5.12	10.10	19.24	21.00	10.10	17.52	16.30	15.00	11.20	10.67	9.55	0.15	5.57	5.72	.	.
SD			2.612	3.099	0.670	0.596	4.645	3.280	0.107	2.010	2.141	2.220	2.207	1.171	2.100	2.040	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG APM DOSE=150 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	31679	.	6.37	6.04	17.00	18.60	20.00	23.20	26.40	24.20	19.50	14.00	9.05	4.07	5.05	5.25	.	.
GI	50079	.	2.05	9.37	0.10	4.93	0.55	11.30	16.50	16.60	16.00	7.73	10.70	6.55	0.21	4.25	.	.
JS	42479	.	5.22	7.02	10.20	16.00	32.70	14.30	13.20	12.70	16.30	5.05	10.10	4.04	3.00	0.40	.	.
KC	50179	.	0.16	26.90	26.00	27.00	27.00	31.00	23.40	10.40	19.70	27.70	20.10	12.90	0.00	0.40	.	.
SG	41979	.	2.47	6.90	21.30	20.30	31.20	25.00	17.10	11.00	10.20	11.20	0.41	0.74	4.00	3.22	.	.
SH	41279	.	4.17	0.20	19.10	19.90	17.20	15.30	17.40	16.60	12.10	6.60	0.00	6.14	0.02	3.94	.	.
MEAN			4.07	10.90	17.23	19.55	23.04	20.02	19.00	16.72	15.77	12.20	11.17	7.30	0.55	4.00	.	.
SD			2.169	7.901	6.976	0.340	0.291	7.570	4.903	4.454	3.670	0.261	4.407	3.000	1.701	2.207	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

033

MEAL STUDY

AMINO ACID LEVELS UNMOLES/100ML

PLASMA AMINO ACID 18: GLUTAMINE

DIET=MEAL D03E=0 MC/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	30279	54.30	62.10	55.30	60.10	52.00	54.50	53.00	61.60	56.20	54.70	55.00	55.00	54.60	54.50	51.00		
G1	41270	60.90	60.30	61.90	64.90	62.60	60.30	60.90	69.60	70.00	70.20	67.30	66.00	62.10	62.30			
J3	50170	41.10	46.90	44.50	45.30	44.80	44.30	49.90	51.50	50.40	49.20	51.20	45.60	43.50	42.50			
K6	51670	62.20	70.50	66.60	72.40	64.40	69.90	65.00	71.00	71.60	66.70	63.00	50.60	59.30	62.90			
SC	50070	62.70	63.60	62.30	64.30	66.80	67.90	69.00	64.60	64.50	61.40	62.50	66.00	60.50	60.10			
SM	50070	57.00	59.20	60.90	57.20	64.70	50.30	64.00	64.70	60.70	60.10	62.10	59.30	63.60	65.70			
MEAN		57.03	61.77	58.50	60.73	59.23	60.53	62.10	63.03	63.57	60.30	60.42	60.30	59.50	55.05			
SD		0.560	0.367	0.702	0.135	0.914	10.072	0.30	5.072	0.404	7.670	5.056	7.610	0.724	7.006			
N		6	6	6	6	6	6	6	6	6	6	6	6	6	6			

DIET=MEAL MSG D03E=150 MC/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	41970	52.50	52.20	61.10	60.10	60.90	61.00	50.90	61.50	55.50	51.00	57.30	50.00	50.00	50.00	47.20		
G1	41970	60.90	63.20	62.20	64.90	60.90	63.30	65.00	60.70	74.90	65.00	60.00	60.00	69.70	62.00	60.50		
J3	50070	30.00	39.70	39.30	45.30	44.30	42.70	40.50	46.00	40.90	50.50	42.60	39.00	41.60	39.50			
K6	41370	63.90	71.30	71.00	71.60	73.00	71.50	74.40	71.60	71.60	70.00	71.60	75.70	60.20	60.50			
SC	41270	60.50	75.20	72.50	65.90	70.00	65.00	74.50	63.00	64.20	67.10	72.70	60.00	64.40	60.00			
SM	51770	64.50	68.00	67.20	73.20	65.00	66.00	67.30	65.20	50.10	67.00	70.40	60.20	61.00	55.50			
MEAN		50.10	61.60	62.35	63.50	63.07	61.05	64.77	61.47	62.37	62.67	63.00	63.25	59.60	64.57			
SD		11.342	13.346	12.237	10.102	10.550	10.001	0.530	0.507	0.040	0.500	11.034	13.050	0.270	0.772			
N		6	6	6	6	6	6	6	6	6	6	6	6	6	6			

DIET=MEAL MSG APM D03E=150 MC/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	51070	50.00	59.60	67.90	66.90	50.90	50.60	50.50	64.10	61.00	50.50	62.00	53.00	52.00	40.00			
G1	52070	67.20	67.50	67.40	62.90	65.10	61.20	61.50	57.20	57.00	60.40	67.20	60.40	65.10	67.20			
J3	42470	42.10	39.90	30.70	41.70	63.30	47.40	52.30	43.50	49.00	45.50	42.50	42.50	43.00	43.00			
K6	50170	64.10	70.10	67.30	64.30	65.10	50.00	63.00	60.10	65.50	60.50	69.50	59.20	63.10	69.20			
SC	41070	70.40	70.60	70.00	61.00	60.20	60.30	69.70	67.00	73.00	77.00	60.10	50.10	65.20	62.20			
SM	41370	60.30	62.20	60.70	50.20	59.70	56.00	50.70	50.30	34.00	60.10	50.10	50.10	61.50	40.70			
MEAN		62.15	62.62	63.47	62.67	63.30	50.00	60.77	50.02	60.15	61.57	61.35	60.78	57.17	53.50			
SD		12.140	12.040	13.461	12.715	5.543	7.133	2.032	0.353	0.420	10.754	10.010	0.400	0.411	7.270			
N		6	6	6	6	6	6	6	6	6	6	6	6	6	6			

MEAL STUDY

PLASMA AMINO ACID 181 GLYCINE

DIET=MEAL DOSE=0 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	38279	.	14.68	27.90	15.90	18.00	15.90	16.00	18.20	18.70	17.70	15.00	14.30	14.30	11.00	10.60	12.50	.	.	.
GI	41279	.	44.10	44.90	31.40	39.10	47.50	49.50	46.70	47.70	46.30	35.40	23.30	23.30	32.00	23.40	25.00	.	.	.
JS	50179	.	11.00	14.50	16.00	16.00	16.90	18.00	21.50	19.00	18.10	16.30	15.20	15.20	12.10	12.20	11.30	.	.	.
KC	51079	.	24.20	31.60	34.60	35.40	32.20	30.30	31.30	29.90	28.50	22.50	17.30	10.00	10.00	10.50	10.50	.	.	.
SC	50879	.	24.50	22.30	29.20	29.80	27.20	27.00	29.70	26.20	26.20	24.70	13.90	13.90	20.90	21.90	20.70	.	.	.
SM	50879	.	20.70	20.50	24.50	20.00	26.90	20.90	26.50	25.20	25.10	21.00	17.00	17.00	16.30	17.20	19.10	.	.	.
MEAN			23.32	26.95	25.27	27.95	27.77	26.52	29.03	27.70	26.00	22.75	17.33	17.33	18.40	16.00	17.65	.	.	.
SD			11.390	10.611	7.930	8.000	11.067	11.025	9.900	10.677	10.437	7.137	3.635	3.635	7.404	0.008	5.404	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	41979	.	15.00	15.10	22.50	22.50	23.10	22.10	18.00	19.50	17.00	15.00	0.04	10.60	14.00	11.10	.	.	.	
GI	41979	.	27.00	28.00	26.70	29.00	31.00	32.30	30.50	28.00	27.40	20.40	22.40	20.10	22.20	20.90	.	.	.	
JS	50879	.	14.50	17.70	17.00	16.00	16.00	16.70	17.60	18.00	17.60	14.10	14.10	11.90	12.10	11.30	.	.	.	
KC	41379	.	20.40	20.20	27.20	27.70	27.70	27.00	24.30	25.10	25.60	20.70	19.70	18.10	17.00	16.50	.	.	.	
SC	41279	.	25.20	26.20	29.20	25.20	25.70	26.30	30.00	26.00	25.40	20.00	27.30	19.70	16.60	10.60	.	.	.	
SM	51779	.	22.90	19.90	30.20	30.30	31.20	20.90	24.00	30.20	22.00	20.20	24.30	10.40	20.70	10.50	.	.	.	
MEAN			22.30	22.52	25.60	25.25	25.92	26.05	25.22	24.37	22.00	24.25	19.31	16.47	17.03	16.63	.	.	.	
SD			6.170	5.674	4.655	4.991	5.066	4.900	7.145	4.726	4.040	6.312	7.100	4.131	4.612	4.334	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG APM DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24 H
CNC	51679	.	20.60	19.90	27.30	26.30	24.90	25.50	25.60	23.60	22.30	19.50	14.30	11.70	12.20	9.51	.	.	.
GI	52379	.	31.40	44.90	40.10	38.00	29.20	30.70	32.20	34.20	33.00	23.20	24.20	22.90	19.70	17.30	.	.	.
JS	42479	.	14.50	24.00	13.00	15.90	16.10	17.30	15.90	16.90	16.90	8.31	13.60	12.40	12.00	12.30	.	.	.
KC	50179	.	21.10	30.30	29.00	31.00	31.00	27.60	24.00	26.10	25.30	27.20	20.90	17.60	13.20	13.10	.	.	.
SC	41970	.	29.40	20.30	20.40	27.90	31.20	28.30	25.00	29.40	31.30	20.00	25.00	23.70	23.20	22.20	.	.	.
SM	41279	.	23.70	20.20	24.20	22.00	25.20	23.00	25.30	25.10	21.20	16.60	17.20	10.30	10.30	16.00	.	.	.
MEAN			23.45	27.93	27.13	25.92	27.32	25.33	25.10	25.72	23.13	20.73	19.30	17.43	10.95	13.53	.	.	.
SD			6.203	0.310	0.401	5.075	3.632	5.030	4.730	6.114	0.305	7.720	5.003	0.073	4.401	4.304	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

MEAL STUDY

AMINO ACID LEVELS UNPUBLISHED

PLASMA AMINO ACID 191 HISTIDINE

DIET=MEAL MSG DOSE=3 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	30279	.	9.36	8.85	11.50	14.28	13.68	13.80	14.70	17.00	16.60	15.10	12.00	9.03	8.82	9.81	.	.	.	
GI	41279	.	11.20	12.20	13.00	12.90	12.70	14.30	15.60	16.90	17.10	11.40	11.20	10.30	9.70	9.50	.	.	.	
JS	30179	.	6.21	10.60	14.50	13.30	15.60	17.80	23.50	22.70	19.40	17.00	19.40	17.00	13.70	11.00	9.34	.	.	
KC	51679	.	7.15	12.90	12.10	10.50	10.40	10.80	11.80	11.30	10.70	9.50	8.01	7.16	6.30	5.74	.	.	.	
SC	50879	.	6.95	6.91	10.70	10.30	10.50	12.50	12.10	10.50	10.40	10.80	9.55	8.12	7.03	7.22	.	.	.	
SH	50879	.	7.27	7.35	9.90	10.70	10.90	11.50	9.64	11.10	10.50	8.40	7.60	6.10	6.44	6.45	.	.	.	
MEAN			8.02	9.67	12.00	11.00	12.10	13.32	14.42	16.00	13.97	12.20	11.30	9.21	8.22	7.91	.	.	.	
SD			1.070	2.502	1.763	1.683	1.800	2.737	4.977	4.044	3.800	4.130	3.661	2.693	1.852	1.836	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.	

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	41979	.	6.61	8.90	11.70	13.20	14.40	15.40	13.50	14.00	13.50	12.00	10.20	8.33	7.43	6.54	.	.	.	
GI	41979	.	6.60	8.55	9.82	10.90	12.20	12.90	12.70	11.20	10.30	10.70	8.52	7.92	6.45	5.03	.	.	.	
JS	50879	.	10.10	9.97	13.00	14.50	12.50	15.40	16.50	17.50	17.00	19.90	14.00	11.40	10.30	10.10	.	.	.	
KC	41379	.	10.10	8.00	9.92	11.50	10.50	9.97	8.00	10.20	11.50	11.70	10.60	9.14	5.11	9.74	.	.	.	
SC	41279	.	6.17	8.07	11.00	10.80	8.94	12.00	15.60	12.90	10.50	12.30	11.00	7.16	6.20	6.00	.	.	.	
SH	51779	.	9.16	10.50	13.40	15.50	17.00	17.70	14.70	15.20	9.90	12.00	10.90	6.00	0.40	7.70	.	.	.	
MEAN			8.70	9.26	11.61	12.60	12.72	13.80	13.65	13.65	12.23	13.23	11.00	8.32	7.34	6.81	.	.	.	
SD			1.449	0.700	1.409	2.156	3.104	2.793	2.700	2.730	3.023	3.340	2.869	1.846	1.840	1.700	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.	

DIET=MEAL MSG APM DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	51679	.	6.34	7.61	11.70	11.90	12.50	13.50	13.60	13.20	12.60	11.90	9.66	7.83	7.74	6.74	.	.	.	
GI	50879	.	6.96	10.00	11.00	6.35	7.91	9.60	12.30	11.60	6.20	10.30	9.16	6.93	4.94	4.79	.	.	.	
JS	42479	.	9.34	9.03	9.31	11.50	10.60	14.10	10.40	14.30	15.10	7.50	13.80	11.60	10.70	10.20	.	.	.	
KC	50179	.	8.40	12.60	14.10	15.20	15.40	15.00	12.70	14.90	12.70	13.20	14.60	11.00	8.73	9.24	.	.	.	
SC	41979	.	6.27	6.55	8.00	6.34	10.60	10.70	10.20	10.00	11.40	10.70	9.50	8.40	7.03	7.20	.	.	.	
SH	41279	.	6.04	9.92	11.70	10.40	11.20	12.30	12.90	13.30	10.20	6.05	7.03	7.61	7.34	9.32	.	.	.	
MEAN			8.04	9.55	10.97	10.95	12.70	12.71	12.86	13.02	11.70	10.00	10.77	9.04	7.75	7.91	.	.	.	
SD			1.170	2.104	2.110	2.575	3.700	2.206	1.717	1.604	2.360	2.454	2.747	2.110	1.011	2.030	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.	

SUBJECT	DATE	WEIGHT
1	10/1/54	150
2	10/1/54	150
3	10/1/54	150
4	10/1/54	150
5	10/1/54	150
6	10/1/54	150
7	10/1/54	150
8	10/1/54	150
9	10/1/54	150
10	10/1/54	150
11	10/1/54	150
12	10/1/54	150
13	10/1/54	150
14	10/1/54	150
15	10/1/54	150
16	10/1/54	150
17	10/1/54	150
18	10/1/54	150
19	10/1/54	150
20	10/1/54	150
21	10/1/54	150
22	10/1/54	150
23	10/1/54	150
24	10/1/54	150
25	10/1/54	150
26	10/1/54	150
27	10/1/54	150
28	10/1/54	150
29	10/1/54	150
30	10/1/54	150
31	10/1/54	150
32	10/1/54	150
33	10/1/54	150
34	10/1/54	150
35	10/1/54	150
36	10/1/54	150
37	10/1/54	150
38	10/1/54	150
39	10/1/54	150
40	10/1/54	150
41	10/1/54	150
42	10/1/54	150
43	10/1/54	150
44	10/1/54	150
45	10/1/54	150
46	10/1/54	150
47	10/1/54	150
48	10/1/54	150
49	10/1/54	150
50	10/1/54	150
51	10/1/54	150
52	10/1/54	150
53	10/1/54	150
54	10/1/54	150
55	10/1/54	150
56	10/1/54	150
57	10/1/54	150
58	10/1/54	150
59	10/1/54	150
60	10/1/54	150
61	10/1/54	150
62	10/1/54	150
63	10/1/54	150
64	10/1/54	150
65	10/1/54	150
66	10/1/54	150
67	10/1/54	150
68	10/1/54	150
69	10/1/54	150
70	10/1/54	150
71	10/1/54	150
72	10/1/54	150
73	10/1/54	150
74	10/1/54	150
75	10/1/54	150
76	10/1/54	150
77	10/1/54	150
78	10/1/54	150
79	10/1/54	150
80	10/1/54	150
81	10/1/54	150
82	10/1/54	150
83	10/1/54	150
84	10/1/54	150
85	10/1/54	150
86	10/1/54	150
87	10/1/54	150
88	10/1/54	150
89	10/1/54	150
90	10/1/54	150
91	10/1/54	150
92	10/1/54	150
93	10/1/54	150
94	10/1/54	150
95	10/1/54	150
96	10/1/54	150
97	10/1/54	150
98	10/1/54	150
99	10/1/54	150
100	10/1/54	150

DIET=MEAL MSG DOSE=188 MG/KG

DIET MEAL MSG 4PM DOSE=150 MG/KG

[illegible]

MEAL STUDY

AMINO ACID LEVELS UNOLBS/100ML

PLASMA AMINO ACID ISI LEUCINE

DIET=MEAL DOSE=0 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CMC	50079	.	.	12.20	15.50	20.10	23.30	23.30	24.60	20.70	32.90	33.40	29.90	24.70	15.30	12.10	13.00	.	.	.	
GI	41279	.	.	15.10	22.90	18.30	21.60	20.50	32.30	34.00	39.20	39.70	39.00	25.40	24.90	16.40	15.60	.	.	.	
JS	50179	.	.	12.30	16.20	15.90	14.60	15.90	23.50	29.40	29.50	30.00	29.00	26.70	19.00	10.30	14.50	.	.	.	
KG	51679	.	.	12.90	20.90	33.90	37.10	36.20	39.00	44.10	40.00	45.70	39.20	31.00	21.10	10.20	16.40	.	.	.	
SC	50079	.	.	11.60	14.00	10.90	19.00	20.20	24.40	30.50	30.90	33.00	33.00	13.50	22.30	22.20	10.40	.	.	.	
SH	50079	.	.	15.00	10.00	25.70	31.60	32.00	30.10	43.20	39.10	39.60	29.90	21.00	17.60	17.50	10.00	.	.	.	
MEAN				13.20	19.52	22.13	24.53	26.02	30.15	35.12	36.60	37.03	33.33	23.90	20.17	17.12	16.12	.	.	.	
SD				1.661	0.466	0.623	0.334	0.606	0.893	0.947	0.922	0.691	4.660	0.004	3.413	3.271	1.040	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG DOSE=150 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CMC	41979	.	.	0.23	14.40	22.50	27.10	29.00	32.50	27.90	32.30	30.40	25.40	10.50	12.00	11.20	10.90	.	.	.	
GI	41979	.	.	9.40	12.00	13.10	15.00	20.20	22.40	22.00	23.90	24.20	32.20	31.60	24.70	10.00	13.50	.	.	.	
JS	50079	.	.	12.40	14.60	14.00	14.20	15.50	21.10	23.70	29.30	29.40	33.00	21.40	14.00	13.90	14.70	.	.	.	
KG	41379	.	.	23.40	22.00	25.20	27.40	29.10	32.00	33.00	37.10	36.00	40.70	33.90	29.00	23.20	22.60	.	.	.	
SG	41279	.	.	14.00	17.30	23.90	19.40	19.90	25.10	40.30	30.70	34.90	42.20	39.00	21.00	19.20	17.10	.	.	.	
SH	51779	.	.	19.90	20.90	31.30	34.00	30.10	42.70	39.10	47.50	37.40	47.20	30.60	23.40	37.10	30.70	.	.	.	
MEAN				14.74	17.00	21.67	23.12	25.47	29.43	31.27	34.00	32.10	36.92	30.63	20.96	20.27	10.23	.	.	.	
SD				5.754	3.754	6.073	7.970	0.590	0.170	7.611	0.211	0.110	7.007	0.050	6.300	0.210	7.272	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG APM DOSE=150 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CMC	51679	.	.	10.90	12.90	26.00	23.50	27.70	31.10	30.60	41.20	41.50	42.50	27.20	16.40	16.60	11.40	.	.	.	
GI	50079	.	.	9.72	16.30	17.30	13.10	14.50	16.10	19.70	25.30	27.50	23.70	36.00	24.50	14.90	12.60	.	.	.	
JS	42479	.	.	10.90	29.30	13.50	14.60	20.00	25.20	29.00	32.70	32.70	16.00	27.10	21.10	15.10	15.10	.	.	.	
KG	50179	.	.	15.70	26.30	26.00	33.00	36.90	39.10	30.20	41.00	42.70	43.00	43.70	32.60	20.90	20.90	.	.	.	
SG	41979	.	.	12.40	12.50	14.30	14.30	17.00	10.40	21.00	24.00	20.00	31.00	32.00	31.00	24.90	20.00	.	.	.	
SH	41279	.	.	16.00	19.00	22.30	22.00	25.70	20.90	37.50	41.00	30.50	20.10	24.60	19.00	10.90	17.30	.	.	.	
MEAN				12.74	19.53	20.17	20.00	23.77	25.77	30.03	33.72	33.32	31.15	31.90	24.30	10.03	16.35	.	.	.	
SD				2.672	7.003	5.004	7.674	0.151	0.092	0.020	0.270	0.492	10.673	7.234	0.507	4.100	4.030	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

MEAL STUDY

PLASMA AMINO ACID ISI LYSINE

DIET=MEAL DOSE=0 MC/KG

SUBJECT		DATE	WEIGHT																				
			TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24			
																				HR			
CNC	30279	.	.	20.20	20.00	30.40	36.00	33.40	35.00	39.10	46.00	45.60	42.50	35.30	23.70	16.00	10.50	.	.	.			
GI	41279	.	.	31.30	39.60	44.50	42.30	48.10	56.30	60.30	65.20	64.00	46.10	43.30	31.50	27.00	26.90	.	.	.			
JS	50179	.	.	11.30	21.30	29.00	24.00	25.00	33.40	46.40	45.50	38.20	39.60	32.30	24.50	10.30	15.70	.	.	.			
KG	51679	.	.	16.30	36.60	47.70	39.60	37.50	39.10	41.20	41.10	30.90	39.50	24.40	17.00	12.00	12.30	.	.	.			
SC	50079	.	.	17.10	20.90	27.00	25.30	27.00	34.70	39.20	36.90	37.40	35.10	16.30	23.30	24.30	17.20	.	.	.			
SH	50079	.	.	16.90	21.20	31.40	34.20	36.30	37.70	43.40	36.90	34.30	20.60	20.70	14.40	10.30	10.40	.	.	.			
MEAN				18.05	26.60	35.00	33.63	34.63	39.50	44.93	45.50	43.20	30.57	28.72	22.53	10.72	17.03	.	.	.			
SD				6.741	8.970	8.702	7.325	7.962	8.480	8.818	10.330	11.213	6.091	10.050	5.012	4.976	4.905	.	.	.			
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.			

DIET=MEAL MSG DOSE=150 MC/KG

SUBJECT DATE		WEIGHT		TIME																		
		0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR					
CNC	41979	15.90	20.50	29.00	34.90	36.40	35.50	30.40	34.40	32.00	30.00	24.40	17.20	17.00	16.30	.	.					
GI	41979	22.60	25.30	30.70	32.10	30.70	45.20	42.90	39.00	36.50	44.20	31.50	27.30	20.00	15.70	.	.					
JS	50079	10.30	19.00	26.00	27.90	23.70	29.00	32.30	35.60	37.10	42.50	26.10	17.50	16.00	15.70	.	.					
KG	41379	26.60	25.00	24.60	25.70	27.40	34.00	32.00	30.70	30.50	29.40	29.00	25.60	16.20	22.30	.	.					
SC	41279	14.90	24.30	31.50	19.00	21.30	33.00	57.00	51.20	32.30	45.90	39.60	10.00	13.00	11.50	.	.					
SH	51779	25.20	33.90	41.90	49.70	57.60	60.00	52.50	54.00	37.40	48.00	39.00	21.30	32.00	20.10	.	.					
MEAN		20.50	24.93	30.00	31.60	34.10	39.50	41.33	41.95	34.30	40.13	31.00	20.90	19.23	18.27	.	.					
SD		4.920	5.054	5.905	10.261	13.303	11.343	11.357	8.400	5.034	0.317	6.509	4.000	6.062	5.920	.	.					
N		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6					

DIET=MEAL MSG APM DOSE=150 MC/KG

SUBJECT		DATE	WEIGHT	TIME																	12	24 HR
				0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8					
CNC	51679	.	.	19.10	21.50	35.30	33.20	36.00	30.30	44.10	44.90	45.10	44.10	31.30	21.50	19.00	17.00	.	.			
GI	50079	.	.	9.77	33.40	33.70	22.40	22.70	20.20	30.70	42.90	37.50	29.90	35.00	15.00	8.47	13.30	.	.			
JS	42479	.	.	13.50	31.70	16.40	18.70	27.60	26.70	30.10	30.00	34.20	16.10	27.50	19.60	16.70	15.60	.	.			
KG	50179	.	.	24.60	41.90	44.70	53.10	56.00	62.10	54.60	60.20	51.30	55.00	51.30	36.00	24.30	25.30	.	.			
SC	41979	.	.	18.10	19.10	21.20	21.00	23.00	20.00	20.00	34.10	41.30	39.90	36.20	20.90	21.20	21.20	.	.			
SH	41279	.	.	20.70	27.70	31.10	29.60	31.00	30.00	44.40	40.70	41.90	25.90	24.20	21.00	19.60	25.60	.	.			
MEAN				17.64	29.22	30.40	29.67	32.05	35.02	40.25	43.60	41.00	35.15	34.50	23.77	10.34	10.33	.	.			
SD				5.261	0.351	10.203	12.726	12.345	14.646	9.550	10.563	5.900	13.948	0.617	0.200	0.432	4.701	.	.			
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6			

MEAL STUDY

AMINOGRAMS
AMINO ACID LEVELS UNOLES/100ML

3123 WEDNESDAY, JULY 25, 1979 27

PLASMA AMINO ACID 191 METHIONINE

DIET=MEAL DOSE=0 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	30270	.	2.29	3.32	3.79	4.49	4.41	4.83	5.57	6.05	6.24	5.95	5.12	3.23	2.12	2.33	.	.
GI	41279	.	8.87	9.19	6.18	7.14	11.68	12.28	11.68	13.10	12.48	8.78	7.47	6.56	5.29	4.88	.	.
JS	50179	.	4.95	5.01	5.20	4.25	6.55	6.97	9.37	8.47	8.82	6.48	7.48	5.35	5.38	4.54	.	.
KG	51679	.	3.65	6.22	9.35	10.68	10.18	9.51	7.94	10.78	10.48	8.52	7.19	5.28	5.38	3.32	.	.
SG	50879	.	2.85	3.10	4.03	4.66	4.69	4.84	6.53	5.94	6.83	6.08	2.92	3.54	3.83	2.45	.	.
SH	50879	.	4.86	4.27	6.28	7.19	7.88	9.34	10.88	8.13	8.14	6.55	5.94	5.35	3.36	3.33	.	.
MEAN			4.44	5.52	5.78	6.39	7.48	7.95	8.58	8.73	8.88	7.55	6.81	4.88	4.21	3.47	.	.
SD			2.361	2.588	2.819	2.454	2.988	2.926	2.257	2.778	2.297	1.572	1.778	1.288	1.335	1.858	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	41979	.	2.25	3.18	4.79	5.09	6.06	6.24	5.58	6.38	5.91	5.12	2.89	2.68	2.67	2.43	.	.
GI	41979	.	2.35	2.89	2.87	3.56	4.54	4.95	5.21	5.64	5.92	6.71	4.83	4.28	3.83	2.97	.	.
JS	50879	.	2.85	2.63	2.79	2.58	2.72	3.14	4.68	5.86	5.66	6.75	4.76	3.12	2.85	2.66	.	.
KG	41379	.	9.51	5.82	7.24	9.13	7.77	9.24	8.08	7.78	10.18	8.77	7.72	8.92	8.35	3.48	.	.
SG	41279	.	2.45	3.67	6.98	7.82	6.89	6.77	10.88	9.33	8.08	9.68	8.89	4.56	4.85	3.90	.	.
SH	51779	.	4.21	6.98	8.86	8.88	10.48	10.58	10.28	10.88	7.99	9.68	8.26	8.18	7.24	6.81	.	.
MEAN			3.94	4.85	5.57	6.13	6.26	6.81	7.46	7.57	7.28	7.76	6.88	4.79	4.83	3.57	.	.
SD			2.825	1.633	2.488	2.695	2.645	2.712	2.527	2.828	1.758	1.838	2.234	2.225	2.383	1.313	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG APM DOSE=150 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	51679	.	3.89	3.78	6.35	5.88	6.15	6.91	8.11	9.27	9.25	8.74	8.86	5.82	5.18	2.74	.	.
GI	50879	.	6.75	5.67	8.29	6.94	6.84	5.95	6.69	7.35	8.42	7.88	8.28	5.69	3.56	4.17	.	.
JS	42479	.	2.71	4.88	3.89	3.85	5.45	4.19	5.48	6.74	6.65	3.33	5.87	4.48	3.64	3.16	.	.
KG	50179	.	3.92	5.72	6.81	7.96	8.64	7.55	7.48	7.88	8.69	9.88	7.21	5.85	3.15	3.61	.	.
SG	41979	.	2.53	2.43	2.95	2.78	3.68	3.48	3.54	4.38	4.83	4.68	4.54	3.67	2.99	2.26	.	.
SH	41279	.	3.47	3.46	4.35	4.18	4.81	5.74	7.19	7.21	6.67	6.95	3.68	2.98	2.88	2.61	.	.
MEAN			3.74	4.32	5.17	5.28	5.91	5.62	6.48	7.14	7.42	6.64	5.81	4.62	3.92	3.88	.	.
SD			1.558	1.318	2.886	2.848	1.748	1.588	1.672	1.887	1.663	2.254	1.722	1.127	1.886	8.785	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

040

NEAL STUDY

PLASMA AMINO ACID 181 OAMTWINE

DIET=NEAL D03E=0 MC/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	30279	•	3.24	6.90	5.13	5.06	5.67	5.97	6.42	7.10	7.45	7.46	7.33	8.31	4.95	3.09	•	•
GI	41279	•	11.70	11.60	12.90	13.20	13.70	14.40	15.00	16.70	14.70	17.20	16.40	12.40	10.80	9.30	•	•
JS	30179	•	2.00	2.37	3.61	2.90	3.45	4.16	5.73	5.77	4.72	4.00	4.02	4.30	3.23	2.64	•	•
KE	31079	•	3.20	0.83	0.76	0.83	0.27	0.87	0.91	10.20	11.00	9.90	9.74	9.82	4.93	4.44	•	•
SC	30079	•	4.72	3.13	6.20	3.67	3.00	0.32	0.14	0.27	0.90	9.91	3.44	0.43	0.24	7.21	•	•
SM	30079	•	5.00	5.13	7.21	7.07	0.02	0.50	10.40	0.02	9.51	9.12	7.40	0.40	0.50	5.95	•	•
MEAN			5.31	6.56	7.47	7.33	7.40	8.45	9.42	9.70	9.30	9.74	8.20	7.01	6.41	5.45	•	•
SD			3.362	3.006	3.370	3.407	3.314	3.600	3.502	3.773	3.363	4.121	4.070	2.010	2.721	2.074	•	•
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	•	•

DIET=NEAL MSC D03E=150 MC/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	41079	•	4.21	4.50	6.03	7.64	7.50	7.23	5.95	6.51	6.12	6.41	5.30	4.03	3.40	3.31	•	•
GI	41079	•	3.52	0.21	7.10	7.70	9.01	10.40	9.95	8.61	8.16	8.07	8.40	9.12	7.00	5.01	•	•
JS	30079	•	2.32	3.30	3.26	0.32	4.16	4.03	4.37	4.56	4.61	4.95	3.52	3.05	3.46	2.50	•	•
KE	41379	•	0.37	0.63	0.99	0.00	7.34	0.03	0.50	0.00	0.92	7.06	0.22	10.30	0.03	0.91	•	•
SC	41279	•	4.03	5.97	0.03	5.54	3.25	0.90	11.30	11.40	0.01	11.00	12.40	6.40	4.72	4.30	•	•
SM	31779	•	6.27	0.46	12.40	12.70	14.50	14.50	13.90	15.00	0.03	14.10	13.00	7.40	0.04	0.03	•	•
MEAN			3.11	3.06	7.43	7.01	8.00	8.77	9.01	9.31	7.57	9.20	8.00	6.73	6.07	5.54	•	•
SD			2.110	1.700	2.035	2.537	3.033	3.320	3.406	3.036	1.010	3.451	3.073	2.027	2.010	2.700	•	•
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	•	•

DIET=NEAL MSC APN D03E=150 MC/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	31679	•	4.52	5.48	7.97	0.34	0.00	0.29	0.91	0.99	9.25	0.00	7.60	6.24	0.13	3.00	•	•
GI	30079	•	3.19	0.79	0.00	6.00	7.66	0.31	10.90	11.30	0.04	9.90	10.80	10.70	0.46	5.94	•	•
JS	42079	•	3.13	10.00	3.44	4.37	5.00	5.22	5.00	3.30	5.33	2.00	3.51	4.50	3.70	4.04	•	•
KE	30179	•	0.40	10.00	10.00	12.70	12.00	12.00	12.00	12.00	13.20	14.40	14.40	12.00	0.00	0.07	•	•
SC	41079	•	3.40	5.92	0.00	7.31	7.04	0.04	0.24	0.10	10.20	10.10	10.30	10.20	7.00	7.04	•	•
SM	41279	•	0.90	7.02	0.73	7.74	7.61	0.74	0.90	11.30	0.53	0.31	7.00	0.51	0.94	6.75	•	•
MEAN			3.10	0.10	7.75	7.06	0.16	0.30	0.30	0.30	9.56	9.10	9.30	0.46	6.30	6.20	•	•
SD			1.100	2.000	2.502	2.740	2.340	2.510	2.201	2.602	2.510	3.717	3.130	3.142	1.700	2.000	•	•
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	•	•

MEAL STUDY

PLASMA AMINO ACID 181 PHENYLALANINE

DIET=MEAL DOSE=0 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	38279	.	5.38	6.78	8.84	8.43	7.89	8.34	8.18	8.66	9.15	7.57	7.52	7.52	8.28	4.81	5.21	.	.	.
GI	41279	.	5.85	6.73	6.78	8.23	11.98	8.14	14.68	14.78	12.18	13.48	6.57	6.57	8.64	5.97	5.65	.	.	.
JS	58179	.	4.47	5.28	5.66	5.93	6.37	6.98	7.79	8.07	7.07	7.34	7.02	5.88	5.31	4.93	.	.	.	.
KG	51679	.	5.01	7.32	8.72	9.48	9.18	9.56	9.81	10.16	9.42	8.89	6.14	5.87	5.87	4.75	5.38	.	.	.
SG	58879	.	4.91	5.54	6.71	6.39	6.29	7.36	8.21	7.97	8.24	8.48	7.72	6.38	6.87	5.23	.	.	.	.
SH	58879	.	5.81	5.98	7.57	9.38	8.77	11.38	9.36	8.99	8.91	6.98	5.47	3.51	8.15	5.93	.	.	.	.
MEAN			5.09	6.58	7.25	7.96	8.39	8.61	9.66	9.75	9.15	8.64	6.74	6.74	5.65	5.34	5.37	.	.	.
SD			0.444	1.268	1.889	1.482	2.884	1.691	2.542	2.548	1.673	2.393	0.854	0.854	1.717	0.565	0.337	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	41979	.	4.24	5.45	7.95	8.39	8.98	9.51	8.88	9.01	8.59	7.12	2.87	4.25	4.78	4.53	.	.	.	
GI	41979	.	4.94	5.65	5.31	6.38	7.73	7.85	8.84	7.64	8.42	8.96	9.17	5.98	6.04	5.64	.	.	.	
JS	58879	.	4.92	4.26	5.68	8.24	5.26	7.96	6.97	7.55	7.02	8.28	5.92	4.42	4.38	4.64	.	.	.	
KG	41379	.	5.99	7.45	7.23	7.48	8.31	8.31	7.58	7.27	8.88	10.28	6.34	4.73	6.84	4.76	.	.	.	
SG	41279	.	5.67	5.98	8.32	4.06	6.89	6.74	6.79	7.36	8.45	9.32	8.94	8.08	4.98	4.76	.	.	.	
SH	51779	.	5.69	6.27	11.88	9.69	10.98	10.68	8.85	10.68	8.14	8.85	7.53	5.68	7.88	5.85	.	.	.	
MEAN			5.24	5.83	7.58	6.99	7.73	8.49	7.98	8.24	8.25	8.95	6.91	5.38	5.59	5.25	.	.	.	
SD			0.655	1.045	2.862	1.865	2.824	1.362	0.682	1.328	0.286	1.123	2.321	0.851	1.418	0.688	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG APM DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	81679	.	4.98	6.91	11.88	10.68	12.28	13.88	14.58	14.98	15.38	15.18	11.18	7.55	6.98	5.75	.	.	.	
GI	58879	.	4.74	14.78	10.88	9.05	9.18	8.91	8.91	8.96	10.28	7.89	10.58	8.47	5.96	4.78	.	.	.	
JS	42479	.	4.63	7.92	7.52	8.18	10.88	10.88	10.68	9.61	9.89	4.91	7.89	5.99	5.43	5.23	.	.	.	
KG	58178	.	4.92	10.28	10.18	10.88	11.68	11.78	9.33	9.81	9.42	12.18	9.12	7.32	4.81	5.54	.	.	.	
SG	41979	.	5.59	7.17	8.88	7.42	8.87	7.73	6.81	8.57	9.26	10.88	8.83	8.12	7.49	6.88	.	.	.	
SH	41279	.	7.09	9.22	10.48	8.48	9.88	9.61	11.58	11.58	10.28	7.11	7.89	5.86	6.88	5.97	.	.	.	
MEAN			5.32	9.35	9.78	9.86	10.15	9.96	10.17	10.56	10.71	9.52	9.88	7.38	5.98	5.34	.	.	.	
SD			0.828	2.882	1.647	1.374	1.621	1.989	2.613	2.354	2.282	3.681	1.518	1.383	1.222	0.872	.	.	.	
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

MEAL STUDY

AMINO ACID LEVELS UNOLCS/100ML

PLASMA AMINO ACID 151 PROLINE

DIET=MEAL DOSE=0 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	31279	.	14.70	30.10	26.50	30.50	28.30	27.60	26.20	29.60	27.30	24.60	20.70	16.70	10.10	14.30	.	.
GI	41279	.	33.30	40.60	30.70	39.50	46.00	56.60	56.40	62.10	53.40	50.10	32.40	36.50	20.00	22.00	.	.
JS	53179	.	10.00	14.50	18.50	19.20	20.20	23.00	26.10	22.10	22.60	20.50	19.10	13.00	12.10	12.20	.	.
KC	51679	.	25.00	29.10	36.00	44.70	41.70	40.00	40.70	40.30	47.00	39.10	36.60	29.50	26.40	30.20	.	.
SC	50679	.	16.70	10.50	23.00	18.60	10.00	25.40	20.00	25.40	22.50	22.70	10.30	16.00	17.00	14.00	.	.
SH	50879	.	24.40	27.50	32.00	37.30	36.60	41.20	44.00	40.00	42.20	35.00	31.00	25.00	30.00	31.00	.	.
MEAN			20.07	26.72	28.07	31.70	32.12	35.95	30.60	30.07	35.00	32.13	26.35	23.22	21.20	20.90	.	.
SD			0.320	0.244	0.301	0.026	0.481	0.670	0.205	0.346	0.567	0.540	0.707	0.072	0.224	0.354	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.

DIET=MEAL MSG DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	41979	.	13.00	17.60	24.20	26.90	29.20	31.10	26.40	29.00	25.60	21.60	10.70	14.10	13.00	12.60	.	.
GI	41979	.	10.40	23.00	25.10	20.40	35.50	30.60	30.00	33.70	39.10	36.40	35.00	25.00	20.70	27.00	.	.
JS	50879	.	13.50	17.90	19.20	17.30	20.50	20.10	20.10	21.90	20.20	20.10	17.30	11.90	14.10	12.30	.	.
KC	41379	.	27.10	29.70	30.50	33.20	32.90	35.30	32.60	29.70	32.90	37.20	29.40	20.40	20.50	24.10	.	.
SC	41279	.	23.20	19.30	22.00	17.00	20.40	22.40	35.70	20.60	20.60	32.90	20.00	17.10	14.40	13.70	.	.
SH	51779	.	31.40	35.20	40.40	46.90	51.60	53.10	40.20	50.50	36.50	50.20	40.20	29.20	36.00	32.90	.	.
MEAN			21.10	23.70	26.00	20.42	31.15	33.50	33.67	32.23	30.40	34.40	29.37	20.05	22.00	20.45	.	.
SD			7.445	7.196	7.003	10.903	12.250	11.920	10.022	0.723	7.003	13.770	10.012	7.531	10.015	0.773	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.

DIET=MEAL MSG APM DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	51679	.	16.00	18.90	27.90	26.60	27.90	29.10	30.00	30.00	30.00	27.20	19.90	15.90	14.00	12.00	.	.
GI	50879	.	22.50	42.70	41.00	36.40	30.00	44.20	47.20	40.10	41.50	32.30	36.00	35.10	26.00	22.20	.	.
JS	42479	.	0.12	21.50	10.00	11.60	17.20	15.00	10.70	10.00	0.00	0.00	15.40	12.00	11.00	10.20	.	.
KC	50179	.	20.60	34.20	34.00	40.70	42.00	39.90	37.30	39.30	41.70	44.00	35.40	22.30	24.90	22.20	.	.
SC	41879	.	10.30	19.00	19.20	19.50	20.30	23.00	23.00	27.50	27.50	20.50	24.70	22.70	21.20	10.30	.	.
SH	41279	.	30.20	20.60	36.30	30.00	34.50	30.00	42.00	42.70	37.70	29.70	20.90	26.00	20.00	24.30	.	.
MEAN			19.25	27.62	20.20	27.95	31.50	32.00	33.30	33.05	33.10	20.40	26.05	23.57	21.02	10.37	.	.
SD			7.200	0.440	11.753	11.153	0.139	10.990	10.905	0.300	0.700	11.306	0.400	0.315	0.434	5.077	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.

MEAL STUDY

AMINO ACID LEVELS UMOL/L/100ML

PLASMA AMINO ACID ISI SERINE

DIET=MEAL DOSE=0 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	33279	.	.	9.34	14.30	12.60	13.00	12.30	12.40	14.20	16.00	15.60	13.50	11.90	9.00	10.00	0.30	.	.	.	
GI	41279	.	.	15.20	19.00	17.00	21.60	20.90	21.30	20.60	21.20	20.70	19.60	11.70	14.90	15.20	13.30	.	.	.	
JS	50179	.	.	11.00	12.40	14.70	15.00	15.90	17.00	22.00	19.20	17.00	17.30	10.20	13.40	14.10	12.10	.	.	.	
KG	51679	.	.	9.01	17.00	20.30	10.30	16.50	16.10	20.20	17.00	17.00	13.90	12.10	8.75	9.30	10.70	.	.	.	
SC	50879	.	.	9.95	12.20	14.60	14.10	14.40	16.50	16.70	15.20	14.00	13.70	13.40	10.70	11.30	9.00	.	.	.	
SM	50879	.	.	10.10	11.90	13.90	15.40	15.70	17.40	17.00	15.10	14.00	11.30	9.20	9.12	0.20	0.30	.	.	.	
MEAN				10.90	14.73	15.65	16.50	15.95	16.92	18.50	17.42	16.65	14.00	12.70	10.99	11.53	10.63	.	.	.	
SD				2.176	3.321	2.050	2.966	2.049	2.000	2.000	2.447	2.425	3.007	2.900	2.502	2.550	1.011	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG DOSE=150 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	41979	.	.	11.10	12.20	17.60	17.70	16.20	16.50	14.60	16.40	14.20	13.10	12.20	9.10	0.00	0.95	.	.	.	
GI	41979	.	.	13.00	16.10	15.00	10.20	20.40	19.60	19.20	19.10	17.40	20.90	16.10	15.40	14.50	12.80	.	.	.	
JS	50879	.	.	13.00	12.10	14.60	12.30	13.30	13.30	16.60	17.90	17.40	17.90	15.00	11.90	11.90	12.10	.	.	.	
KG	41379	.	.	13.70	16.60	17.70	10.00	16.30	16.90	14.90	15.10	15.70	17.40	12.70	11.70	11.00	12.20	.	.	.	
SC	41279	.	.	12.10	15.20	12.70	13.30	13.60	14.30	17.60	12.20	15.40	12.00	12.00	10.90	0.50	0.25	.	.	.	
SM	51779	.	.	12.70	12.30	15.00	15.20	15.00	14.00	15.40	13.90	13.50	17.40	15.40	9.00	12.70	12.10	.	.	.	
MEAN				12.60	14.00	15.70	15.70	16.60	16.23	16.30	15.77	15.60	16.50	14.03	11.50	11.50	11.23	.	.	.	
SD				0.699	2.112	1.000	2.572	2.043	2.003	1.770	2.550	1.606	3.103	1.657	2.177	2.030	1.670	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG APM DOSE=150 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	51679	.	.	10.60	1.17	17.50	16.20	16.90	17.20	10.50	17.90	17.00	15.70	12.30	9.37	9.75	0.21	.	.	.	
GI	52879	.	.	13.70	22.10	20.00	16.30	16.00	10.10	19.10	19.70	20.90	15.10	10.00	14.50	11.50	0.07	.	.	.	
JS	42479	.	.	11.70	13.00	13.40	14.50	19.90	15.00	17.10	16.20	17.70	0.30	10.20	12.00	12.60	12.20	.	.	.	
KG	50179	.	.	10.60	17.40	17.30	20.10	20.70	10.20	16.70	10.10	10.30	14.30	10.20	11.60	9.00	10.20	.	.	.	
SC	41979	.	.	9.31	11.20	11.40	11.40	14.90	12.30	11.70	10.10	13.70	13.70	10.20	12.00	11.20	7.03	.	.	.	
SM	41279	.	.	16.10	14.30	17.90	14.30	17.00	17.00	10.50	19.60	15.40	12.00	12.00	11.00	11.00	10.90	.	.	.	
MEAN				12.00	13.19	16.30	15.47	17.57	16.43	17.10	17.30	17.13	13.00	14.03	11.90	11.02	0.07	.	.	.	
SD				2.400	7.026	3.305	2.002	2.002	2.345	2.005	2.104	2.400	3.305	3.004	1.730	1.124	1.644	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

AMINOGRAMS AMINO ACID LEVELS UNOL/100ML

3123 WEDNESDAY, JULY 25, 1979

MEAL STUDY

PLASMA AMINO ACID ISI TAURINE

DIET/MEAL DOSE=0 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CMC	38279	.	.	9.35	9.51	9.52	9.27	8.27	8.85	11.20	12.68	12.70	9.47	9.97	8.89	11.70	10.58	.	.	.	
GI	41279	.	.	7.75	6.36	4.98	5.16	6.65	7.33	8.12	8.06	10.10	7.84	6.10	7.40	4.91	4.37	.	.	.	
JS	58179	.	.	3.15	3.27	4.29	5.22	5.06	5.70	6.38	5.85	4.78	4.25	4.54	3.41	4.75	2.48	.	.	.	
KG	51679	.	.	4.78	5.38	6.31	6.08	5.23	5.48	6.45	7.04	5.48	4.69	4.89	4.72	4.43	4.78	.	.	.	
SG	58679	.	.	4.80	3.94	5.89	8.29	8.63	6.65	6.56	6.52	5.38	4.78	3.59	4.97	4.60	4.78	.	.	.	
SH	58879	.	.	5.85	6.08	5.47	6.89	6.37	6.93	7.95	7.87	6.87	5.31	4.71	4.42	4.31	5.38	.	.	.	
MEAN				5.81	5.76	5.98	6.82	6.73	6.82	7.68	7.76	7.52	6.86	5.65	5.63	5.88	5.37	.	.	.	
SD				2.354	2.199	1.478	1.671	1.280	1.222	2.037	2.668	3.192	2.185	2.275	2.870	2.090	2.714	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET/MEAL MSG DOSE=150 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CMC	41979	.	.	3.80	2.86	3.75	5.25	5.82	5.18	3.62	4.29	3.78	3.23	3.61	2.64	2.32	2.47	.	.	.	
GI	41979	.	.	4.39	3.78	3.77	4.47	4.76	7.35	4.70	5.26	6.23	5.21	6.25	6.21	4.78	4.59	.	.	.	
JS	50870	.	.	4.11	2.87	7.23	7.48	8.18	8.13	6.25	6.72	6.38	5.19	4.17	7.48	4.27	4.13	.	.	.	
KG	41320	.	.	7.13	5.27	5.35	7.21	8.55	6.03	5.72	5.23	5.78	6.26	5.24	4.23	3.68	4.66	.	.	.	
SG	41270	.	.	6.49	6.40	9.77	6.05	7.88	6.27	6.36	5.47	4.68	5.81	5.59	4.44	4.13	3.35	.	.	.	
SH	51770	.	.	7.08	6.06	7.25	7.86	9.02	7.55	6.51	7.17	6.63	7.08	8.62	4.80	6.72	6.88	.	.	.	
MEAN				5.37	4.55	6.19	6.52	7.22	6.88	5.86	5.69	5.59	5.53	5.58	4.95	4.32	4.33	.	.	.	
SD				1.718	1.682	2.347	1.345	1.858	1.848	1.625	1.864	1.185	1.414	1.771	1.686	1.444	1.465	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET/MEAL MSG APM DOSE=150 MC/KG

SUBJECT	DATE	WEIGHT	TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CMC	51679	.	.	5.77	4.12	4.92	4.95	5.84	7.33	5.81	7.64	6.34	4.54	4.12	3.74	3.28	3.85	.	.	.	
GI	58879	.	.	6.15	5.42	5.74	8.45	4.46	5.88	6.88	8.39	6.58	5.76	6.29	5.76	3.88	3.93	.	.	.	
JS	42479	.	.	3.59	6.98	3.52	4.97	9.31	8.88	6.33	4.56	5.80	4.45	4.45	4.74	4.68	8.38	.	.	.	
KG	58179	.	.	4.92	6.16	6.84	8.45	8.71	8.45	6.15	6.58	5.77	6.86	5.33	4.74	4.68	8.38	.	.	.	
SG	41979	.	.	4.65	4.37	5.21	7.13	6.48	7.28	6.36	7.16	6.58	4.97	4.99	5.19	3.83	3.86	.	.	.	
SH	41279	.	.	7.39	5.42	7.88	7.46	18.68	7.49	7.44	6.96	5.58	5.38	4.78	4.65	5.48	4.88	.	.	.	
MEAN				5.41	5.41	5.55	6.98	7.55	7.84	6.35	6.38	5.96	5.23	4.91	4.64	4.32	4.16	.	.	.	
SD				1.321	1.875	1.317	1.594	2.347	1.821	0.573	1.174	0.828	1.827	0.789	0.798	0.833	0.835	.	.	.	
N				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

MEAL STUDY

PLASMA AMINO ACID ISI THREONINE

DIET=MEAL DOSE=0 MC/KG

SUBJECT DATE WEIGHT

TIME 0 15 30 45 60 90 120 150 MIN 3 4 5 6 7 8 12 24 HR

CNC	30279	13.20	16.60	20.60	24.00	21.70	22.00	24.00	20.00	28.30	26.30	24.40	18.40	15.80	16.50
GI	41279	19.30	22.70	20.20	25.50	27.80	29.40	29.90	31.90	32.00	29.30	18.70	21.00	19.30	16.80
JS	50179	17.90	22.20	24.90	26.50	26.00	25.90	36.00	33.50	32.40	32.60	34.30	27.00	25.50	22.90
KC	51679	11.30	21.30	26.70	24.00	22.90	23.50	29.00	28.00	27.00	22.90	18.50	14.00	12.90	12.00
SG	50879	10.50	11.30	14.90	14.90	14.90	15.30	10.00	10.00	10.10	10.00	14.00	13.90	13.40	11.70
SH	50879	11.10	12.30	15.10	16.60	16.00	21.40	22.70	21.00	20.30	17.50	13.30	12.00	12.90	13.30

MEAN	14.22	18.17	20.40	22.35	22.00	23.63	27.22	27.00	26.50	24.57	20.67	18.22	16.63	15.08	
SD	3.005	5.148	4.865	4.572	4.896	3.673	6.795	5.895	5.585	5.931	7.780	6.667	4.995	4.981	
N	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG DOSE=150 MC/KG

SUBJECT DATE WEIGHT

TIME 0 15 30 45 60 90 120 150 MIN 3 4 5 6 7 8 12 24 HR

CNC	41979	19.10	22.00	20.10	31.10	33.00	34.00	29.20	32.50	29.40	27.70	24.10	18.70	18.90	17.20
GI	41979	15.00	17.70	17.30	19.80	24.00	24.30	24.50	26.30	23.70	29.60	22.70	21.30	19.10	16.00
JS	50879	23.00	21.30	24.50	21.50	23.10	23.00	30.00	33.30	34.10	37.20	29.00	24.60	24.90	23.40
KC	41379	17.20	10.00	21.10	22.30	23.90	22.50	19.00	21.50	23.50	26.50	19.10	16.40	15.40	14.70
SG	41279	11.40	13.10	14.60	13.50	14.70	16.70	21.40	17.10	20.10	18.10	17.10	13.00	18.00	10.10
SH	51779	15.20	14.10	21.00	22.90	24.00	25.50	22.30	25.70	22.40	27.70	24.00	16.90	21.00	20.60

MEAN	16.95	17.67	21.23	21.85	23.92	24.33	24.53	26.07	25.53	27.00	22.93	18.40	18.35	17.88	
SD	4.226	3.446	4.858	5.073	5.812	5.625	4.216	6.247	5.199	6.122	4.489	4.857	4.714	4.645	
N	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

DIET=MEAL MSG APM DOSE=150 MC/KG

SUBJECT DATE WEIGHT

TIME 0 15 30 45 60 90 120 150 MIN 3 4 5 6 7 8 12 24 HR

CNC	51679	18.20	19.00	22.30	27.50	27.80	29.30	31.00	32.10	30.90	29.40	23.30	18.00	17.10	13.70
GI	50879	16.30	24.40	22.40	18.10	17.50	18.90	20.40	21.30	24.70	10.60	23.70	19.30	13.00	11.70
JS	42479	13.20	17.30	14.90	17.00	24.30	19.00	22.00	21.10	24.20	11.70	19.60	10.60	17.00	
KC	50179	13.30	21.00	22.30	26.10	27.70	27.10	23.00	26.30	26.80	20.90	22.90	10.00	12.00	12.70
SG	41979	11.10	16.60	11.30	14.30	14.50	13.40	15.60	16.70	17.20	10.10	15.00	10.00	14.40	11.00
SH	41279	19.40	15.30	21.20	18.50	21.30	24.00	27.30	28.10	23.40	19.80	18.40	16.40	16.00	15.20

MEAN	15.25	18.27	19.98	19.75	22.18	21.95	23.47	24.27	24.53	21.88	20.48	17.72	15.35	13.68	
SD	3.233	4.825	5.767	6.060	5.444	5.931	6.390	5.991	4.402	6.856	3.444	1.275	1.925	2.806	
N	6	6	6	6	6	6	6	6	6	6	6	6	6	6	

MEAL STUDY

PLASMA AMINO ACID 191 TYROSINE

DIET=MEAL DOSE=0 MC/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	30279	.	4.26	9.20	6.79	7.83	7.87	8.40	9.30	10.00	11.10	10.20	9.04	6.72	4.03	5.31	.	.
GI	41279	.	6.34	7.92	6.98	8.07	11.00	9.02	14.90	15.50	14.50	15.30	10.70	10.20	7.45	6.34	.	.
JS	50170	.	4.03	5.46	6.13	6.00	6.70	8.77	10.60	10.90	11.10	10.90	10.50	7.20	6.07	5.41	.	.
KC	51670	.	6.19	9.92	12.30	15.30	14.60	15.10	16.40	16.00	15.60	12.00	10.50	8.00	6.52	6.40	.	.
SC	50070	.	4.00	5.26	6.30	6.24	6.31	7.76	6.50	6.60	9.21	0.91	0.00	6.10	5.73	5.04	.	.
SH	50070	.	8.04	7.00	9.30	11.50	11.90	15.20	15.60	14.40	14.70	11.90	0.64	5.00	6.70	7.00	.	.
MEAN			5.22	7.40	7.98	9.29	9.00	10.71	12.57	12.04	12.70	11.07	10.56	7.30	6.10	5.92	.	.
SD			1.020	1.920	2.403	3.562	3.300	3.467	3.447	3.101	2.507	2.231	4.314	1.590	1.175	0.772	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	0	0

DIET=MEAL MSG DOSE=150 MC/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	41970	.	4.05	4.05	7.20	0.42	9.14	10.20	9.10	10.60	10.20	6.04	4.70	4.61	4.39	4.05	.	.
GI	41970	.	5.00	6.09	5.63	6.79	8.60	9.40	10.00	9.90	10.40	12.00	11.00	8.15	7.07	5.95	.	.
JS	50070	.	5.17	5.14	6.90	6.15	6.60	8.75	8.74	9.94	11.10	12.60	9.25	7.05	6.11	5.00	.	.
KC	41370	.	0.03	9.00	0.99	9.17	0.20	11.20	10.00	11.40	11.30	13.10	10.10	0.30	5.07	6.70	.	.
SC	41270	.	5.00	5.72	0.31	5.43	5.72	6.92	10.10	0.62	0.70	9.00	9.26	5.10	4.24	3.91	.	.
SH	51770	.	7.94	0.12	13.50	14.70	17.10	10.00	15.00	10.60	14.70	17.50	13.30	0.90	13.00	10.20	.	.
MEAN			5.00	6.65	0.43	0.44	9.32	10.74	10.00	11.60	11.00	11.90	9.73	7.05	7.03	6.00	.	.
SD			1.001	1.014	2.730	3.360	4.022	3.030	2.611	3.000	1.902	3.547	2.930	1.794	3.502	2.206	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	0	0

DIET=MEAL MSG APM DOSE=150 MC/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CNC	51670	.	6.53	7.40	13.00	12.10	13.70	15.00	10.60	19.20	10.00	10.90	14.50	10.20	0.74	6.97	.	.
GI	50070	.	5.40	11.00	9.95	0.44	8.50	9.27	10.00	11.50	12.50	10.20	14.30	11.30	7.57	5.92	.	.
JS	42470	.	4.97	0.22	5.90	6.67	0.70	0.30	11.30	12.10	12.00	6.45	11.30	9.11	7.24	6.00	.	.
KC	50170	.	6.40	11.40	12.10	14.40	16.10	17.30	15.40	15.00	14.50	16.50	13.10	9.95	5.90	6.00	.	.
SC	41970	.	5.52	5.30	6.20	6.02	7.30	7.35	6.10	7.00	8.10	0.07	7.04	7.30	6.20	5.15	.	.
SH	41270	.	0.33	0.90	10.60	9.01	10.00	13.00	15.50	16.30	15.10	11.70	10.60	0.42	0.02	7.00	.	.
MEAN			6.20	0.00	9.65	9.57	11.03	12.07	12.03	13.00	13.61	12.10	11.94	0.30	7.30	6.31	.	.
SD			1.212	2.440	2.930	3.227	3.300	3.940	4.900	4.065	3.510	4.727	2.540	1.410	1.040	0.730	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	0	0

MEAL STUDY

AMINOGRAMS
AMINO ACID LEVELS UMOL/3/100ML

3123 WEDNESDAY, JULY 26, 1970 43

PLASMA AMINO ACID IS: TYROSINE

DIET-ON- MEAL DOSE-00 MG/KG

[illegible]

DIETONEAL NSC DOSE=150 MG/KG

SUBJECT	DATE	WEIGHT TIME	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24
CNC	41079	.	4.05	4.05	7.20	8.42	9.14	10.20	9.16	10.00	10.20	6.84	4.70	4.61	4.39	4.05	.	.	.
GI	41979	.	5.00	6.09	5.63	6.79	6.68	9.40	10.00	9.94	10.40	12.80	11.60	8.15	7.97	5.95	.	.	.
JS	5079	.	5.17	5.14	6.90	6.15	6.68	8.70	8.74	9.94	11.10	12.60	9.25	7.85	6.11	5.66	.	.	.
KC	4179	.	5.08	8.99	6.17	9.78	11.20	10.90	11.20	11.30	13.10	10.10	8.30	8.67	6.70	.	.	.	.
OC	41370	.	0.00	5.72	0.31	5.73	5.72	6.92	10.10	8.62	0.70	9.89	9.26	5.16	4.24	5.91	.	.	.
SM	5179	.	7.94	9.12	13.50	14.70	17.10	10.00	15.00	10.00	14.70	17.50	13.50	6.90	13.00	10.20	.	.	.
MEAN			5.00	6.65	6.43	8.44	9.52	10.74	10.00	11.00	11.00	11.59	9.73	7.85	7.03	6.00	.	.	.
SD			1.01	1.014	2.730	3.360	4.822	3.836	2.611	3.000	1.002	3.537	2.720	1.794	3.982	2.896	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.

DIETONAL MSG APR 005E-156 MG/KG

SUBJECT	DATE	WEIGHT	0	15	30	45	60	90	120	150	MIN	3	4	5	6	7	8	12	24	HR
CNC	51679	.	6.53	7.46	13.60	12.10	13.70	15.30	16.68	19.20	16.80	16.90	16.20	14.30	10.20	0.74	0.97	.	.	.
GI	58079	.	5.40	11.00	9.95	6.44	11.8.50	9.27	10.68	11.30	12.50	10.20	6.45	11.30	9.11	7.57	5.92	.	.	.
JS	42479	.	4.97	0.22	5.90	6.67	9.79	10.67	11.30	12.10	12.60	10.20	6.45	11.30	9.11	7.24	6.86	.	.	.
KE	50779	.	6.48	11.40	12.10	14.40	17.30	19.30	15.40	15.00	14.50	16.50	10.50	13.10	9.95	0.90	0.60	.	.	.
SC	41979	.	5.52	5.36	6.20	6.02	7.30	7.36	6.10	7.00	0.16	0.16	0.87	7.04	7.30	6.20	5.15	.	.	.
SM	41279	.	0.33	0.96	10.60	0.01	10.00	13.00	15.50	10.30	15.10	11.70	11.70	10.00	0.42	0.02	7.00	.	.	.
MEAN			6.20	8.06	9.65	9.57	11.03	12.07	12.03	13.00	13.61	12.10	11.94	9.30	7.30	6.31	.	.	.	.
SD			1.912	2.445	2.939	3.227	3.309	3.948	4.500	4.060	3.519	4.727	2.640	1.415	1.048	0.730	.	.	.	.
N			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	.	.	.

3123 WEDNESDAY, JULY 23, 1978 43

049

WEIGHT	TIME
0	15
15	30
30	45
45	60
60	90
90	120
120	150 MIN
150 MIN	3
3	4
4	5
5	6
6	7
7	8
8	12
12	24
24	NO

CRC	36279	22.30	20.50	32.60	36.30	37.00	42.60	51.50	50.00	49.70	47.50	36.40	34.00	33.20	.
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MEAN	24.58	27.03	32.43	35.63	37.53	42.05	40.03	51.35	53.47	61.97	42.35	39.68	36.68	34.17
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[illegible]

DIET=MEAL MSG DOSE=150 MG/KG

WEIGHT	TIME
0	
15	
30	
45	
60	
90	
120	
150 MIN	
3	
4	
5	
6	
7	
8	
18	
24 HR	

CMC	41979	24.60	27.30	37.50	41.50	44.30	49.20	44.50	52.20	49.80	46.90	24.70	32.10	29.00	20.20
CMC	41979	24.60	27.30	37.50	41.50	44.30	49.20	44.50	52.20	49.80	46.90	24.70	32.10	29.00	20.20

[illegible][illegible]

	MEAN
26.61	29.25
35.46	35.46
34.92	37.73
41.32	41.32
45.37	45.37
48.37	48.37
47.32	47.32
57.92	57.92
48.78	48.78
58.45	58.45
50.15	50.15
56.77	56.77

2

DIET MEAL MSG APM DOSE=150 MG/KG

	WEIGHT
B	THE
15	
38	
45	
68	
98	
120	
156 MM	
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CMC	51679	22.80	24.30	35.70	35.60	37.90	42.60	52.70	56.90	58.20	61.10	58.20	37.60	76.20	88.20
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[illegible][illegible]

	MEAN
27-42	22.70
27-48	21.06
27-54	21.62
27-60	27.25
27-66	27.12
27-72	41.75
27-78	47.28
27-84	48.98
27-90	46.13
27-96	48.47
27-102	47.56
27-108	48.36
27-114	47.47

30	7.977	9.064	8.873	9.914	9.506	12.210	12.868	11.934	10.730	10.897	9.671	6.848	4.072	5.610	0
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MEAL STUDY

AMINO ACID LEVELS UNOL/100ML

3123 WEDNESDAY, JULY 25, 1979

050 45

PLASMA AMINO ACID IS: 1/20CYSTINE

DIET/MEAL DOSE=0 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CMC	58279	.	11.40	11.40	10.90	11.00	10.70	10.40	12.10	12.40	12.00	9.00	9.42	6.15	6.30	6.05	.	.
GI	41279	.	13.90	13.10	10.10	14.70	13.30	15.00	14.20	15.10	13.90	13.20	7.30	11.70	0.89	0.41	.	.
JS	54179	.	9.26	12.30	11.50	11.60	11.30	10.50	11.40	10.60	9.90	9.34	10.10	0.25	0.30	0.30	.	.
KC	51679	.	13.90	11.90	14.20	14.60	13.60	14.00	13.10	11.20	11.50	11.10	9.61	9.95	10.10	11.00	.	.
SC	53079	.	10.70	10.30	12.30	12.90	11.60	12.40	13.70	11.60	11.70	11.00	10.90	10.40	11.40	10.30	.	.
SM	50879	.	10.00	11.90	11.70	13.00	12.00	14.20	12.90	11.00	15.20	11.00	7.30	7.54	0.30	0.84	.	.
MEAN			11.60	12.00	11.02	12.07	12.25	12.75	12.90	12.92	12.05	11.07	9.13	9.00	8.89	9.32	.	.
SD			1.063	0.829	1.410	1.634	1.220	1.972	1.02	1.700	1.372	1.300	1.455	2.040	1.724	1.500	.	.
N			6	0	0	6	6	6	0	6	0	6	6	6	0	0	0	0

DIET/MEAL MSG DOSE=150 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CMC	41979	.	0.73	0.43	10.60	10.30	10.70	10.30	9.20	10.40	9.52	0.61	5.24	7.90	0.10	0.42	.	.
GI	41979	.	9.01	10.10	0.27	0.37	9.50	0.91	9.07	9.11	11.00	9.33	9.99	0.21	9.30	9.60	.	.
JS	50679	.	10.60	12.20	13.40	12.70	12.00	13.20	9.41	9.50	9.79	10.40	7.81	7.73	7.63	7.50	.	.
KC	41379	.	17.50	15.00	12.30	12.30	12.30	13.00	12.10	10.40	11.00	11.10	6.30	0.06	11.00	11.40	.	.
SC	41279	.	12.40	12.00	14.90	11.30	11.40	11.00	17.00	14.30	12.10	15.70	15.00	10.00	9.30	9.47	.	.
SM	51779	.	10.70	10.40	13.00	15.30	15.50	15.70	11.50	15.20	9.20	10.70	12.90	9.20	10.90	10.40	.	.
MEAN			11.62	11.62	12.21	11.74	12.05	12.20	11.62	11.50	10.50	12.31	9.60	9.10	9.30	9.47	.	.
SD			3.121	2.005	2.421	2.341	2.043	2.404	3.147	2.503	1.215	4.000	4.053	1.413	1.374	1.300	.	.
N			0	0	0	6	6	6	0	6	0	6	6	6	0	0	0	0

DIET/MEAL MSG APM DOSE=150 MG/KG

SUBJECT DATE		WEIGHT	0	15	30	45	60	90	120	150 MIN	3	4	5	6	7	8	12	24 HR
CMC	51679	.	10.90	12.00	13.10	11.20	11.20	9.07	9.95	12.30	11.40	9.10	0.99	6.42	9.75	6.00	.	.
GI	50679	.	0.20	17.10	14.90	11.90	10.90	10.50	10.90	10.70	10.10	7.05	9.20	0.76	7.90	7.92	.	.
JS	42479	.	9.70	11.70	10.20	11.40	16.20	9.09	10.10	10.30	10.60	5.03	0.15	0.06	0.10	9.33	.	.
KC	50179	.	12.40	15.00	14.10	13.00	13.60	14.40	12.90	13.60	12.50	14.50	12.00	11.00	10.00	10.00	.	.
SC	41079	.	9.10	12.20	11.90	12.10	13.30	11.00	11.30	11.70	12.60	12.40	10.60	11.50	11.00	10.40	.	.
SM	41279	.	10.30	9.40	11.00	10.10	11.20	9.70	11.20	9.02	9.00	9.00	0.97	9.00	7.21	7.00	.	.
MEAN			10.14	13.10	12.53	11.75	12.73	10.00	11.00	11.27	11.13	9.91	9.66	9.23	9.24	8.05	.	.
SD			1.425	2.700	1.021	1.224	2.057	1.040	1.002	1.013	1.240	3.301	1.303	2.014	1.772	1.507	.	.
N			0	0	0	6	6	6	0	6	0	6	6	6	0	0	0	0

APPENDIX II

Project entitled: "Hamburger/Milkshake"

Dialogue with Human Volunteers

We are interested in studying the rate of absorption of the amino acid, glutamic acid, when administered as monosodium glutamate at a dose of 150 mg per kg body weight in the fasting state. We are also interested in studying the dipeptide, aspartame (at 23 mg/kg), given in conjunction with the monosodium glutamate ingested with hamburger. The aspartame will be part of a milkshake.

This is a cross-over type of experiment in which you will go through the procedure three times. You will receive:

- a) Hamburger with no MSG plus a milkshake with no aspartame;
- b) Hamburger with MSG plus a milkshake with no aspartame;
- c) Hamburger with MSG plus a milkshake with aspartame.

The study will be carried out in the Pediatric Outpatient Clinic on the first floor of University Hospitals. You will be asked to report there at 0730 hours, having fasted from midnight. A needle will be placed in a forearm vein so that timed blood samples can be removed without repeated venipunctures. Two or 3 cc of a dilute heparin solution will be instilled into the needle between the removal of blood samples to prevent clotting. Blood samples 5 ml in volume will be obtained at 0, 15, 30, 45, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes after ingestion of the meal. The total volume of blood to be removed is less than 4 ozs.

A brief medical history and physical examination will be performed on each subject. Each participant will receive a urinalysis and an SMA 12/60, 6/60. All women will provide an a.m. urine specimen for pregnancy testing. Each participant will be asked to forego alcohol and other drug ingestion for a period of 24 hours prior to testing.

Discomforts attendant to the procedure will be that of hunger, since food will be restricted other than the test meal to be provided at 0800 hours. The other discomfort is that associated with venipuncture, which should be limited to one such procedure. Confinement in the test area during the time of blood withdrawal and associated boredom will be a source of annoyance.

You are obviously free to withdraw from the project at any time without prejudice. Since the design of the project calls for establishing the response of each subject to three test situations, you will be paid \$150 for the completion of the total study. Since failure to complete the three tests invalidates the use of any one subject, withdrawal prior to completion of the study design will result in only partial payment of the allocated fee (\$50 per 8 hour study).

There are no identifiable benefits to you; however, these studies will permit us to establish what influence if any the administration of amino acids or a dipeptide produce in a plasma aminogram when given in conjunction with a meal and beverage.

Hamburger/Milkshake

Page 2

I have discussed the above points with the subject or his legally authorized representative using a translator if necessary. It is my opinion that the subject understands the risks, benefits, and obligations involved in participation in this project.


Investigator

053

(CLINICAL STUDIES -- NORMAL SUBJECTS)

Name [REDACTED] CMC Date 7/7 3/08

Sex 1 Birthdate 3/12/51

Place a check in front of each item if any relative has had the following:

Indicate relationship after each item using these code letters

Mother - M

Father - F

Aunt - A

Uncle - U

Brother - B

Sister - S

<u>8</u> <u>15</u>	Allergies	_____	_____	Tuberculosis	_____
<u>2</u> <u>5</u>	Asthma or Hay Fever	_____	_____	Gout	_____
_____	Anemia	_____	_____	Heart Trouble	_____
_____	Cancer or Tumor	_____	_____	Stroke	_____
_____	Diabetes	_____	_____	<u>7</u> <u>1</u>	High Blood Pressure
_____	Bleeding Problem	_____	_____	<u>1</u> <u>1</u>	Kidney Trouble
_____	Epilepsy (Convulsions)	_____	_____	_____	Arthritis
_____	Glaucoma	_____	_____	_____	Ulcer

Place a check in front of each item if you now have or have ever had any of the following:

<input type="checkbox"/> Diabetes	<input type="checkbox"/> Arthritis	<input type="checkbox"/> Yellow Jaundice
<input type="checkbox"/> Hives or Skin Rashes	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Malaria
<input type="checkbox"/> Chest Disease	<input type="checkbox"/> Gout	<input type="checkbox"/> Venereal Disease
<input type="checkbox"/> Eye Disease	<input type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> Polio
<input type="checkbox"/> Liver Disease	<input type="checkbox"/> Pancreatitis	<input type="checkbox"/> Dental Problems
<input type="checkbox"/> Neuralgia or Neuritis	<input type="checkbox"/> Thyroid Disease	<input type="checkbox"/> Tuberculosis
<input type="checkbox"/> Any Serious Accidents	<input type="checkbox"/> Rheumatic Fever	<input type="checkbox"/> Kidney Trouble
<input type="checkbox"/> Any Surgery	<input type="checkbox"/> Scarlet Fever	<input type="checkbox"/> Cancer or Tumor
<input type="checkbox"/> Hospitalizations	<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Stroke
<input type="checkbox"/> Heart Trouble	<input type="checkbox"/> Anemia	<input type="checkbox"/> Menstrual Disorders
<input type="checkbox"/> Mononucleosis		

List Any Other Illness _____

If you have checked any of the above spaces or listed any other illness, please record below:

Illness or Operation	Month and Yr.	Hospitalized	If yes, how long?
T.B.	12/56	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	___ mos. ___ wks. 0 da.
Polio	11/63	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	___ mos. ___ wks. 2 da.
		Yes <input type="checkbox"/> No <input type="checkbox"/>	___ mos. ___ wks. ___ da.
		Yes <input type="checkbox"/> No <input type="checkbox"/>	___ mos. ___ wks. ___ da.

SCREENING HEALTH QUESTIONNAIRE

CHECK THE APPROPRIATE SPACE FOR EACH OF THE FOLLOWING QUESTIONS:

Do you or have you ever had:

Yes	No	Yes		No
<input type="checkbox"/> Frequent Eye Infections	<input type="checkbox"/>	<input type="checkbox"/>	Soaking Night Sweats	<input type="checkbox"/>
<input type="checkbox"/> Double Vision	<input type="checkbox"/>	<input type="checkbox"/>	Tightness in Your Chest	<input type="checkbox"/>
<input type="checkbox"/> Blurred Vision	<input type="checkbox"/>	<input type="checkbox"/>	Abnormal EKG (Electrocardiogram)	<input type="checkbox"/>
<input type="checkbox"/> Pain in the Eyes	<input type="checkbox"/>	<input type="checkbox"/>	Fluttering of Heart	<input type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input type="checkbox"/>	<input type="checkbox"/>	Frequent diarrhea	<input type="checkbox"/>
<input type="checkbox"/> Cataracts	<input type="checkbox"/>	<input type="checkbox"/>	Frequent Constipation	<input type="checkbox"/>
<input checked="" type="checkbox"/> Poor Vision	<input type="checkbox"/>	<input type="checkbox"/>	Blood in Your Stools	<input type="checkbox"/>
<input type="checkbox"/> Frequent Earaches	<input type="checkbox"/>	<input type="checkbox"/>	Black or Tarry Stools	<input type="checkbox"/>
<input type="checkbox"/> Ringing in Ears	<input type="checkbox"/>	<input type="checkbox"/>	Difficulty in Swallowing	<input type="checkbox"/>
<input type="checkbox"/> Frequent Nosebleeds	<input type="checkbox"/>	<input type="checkbox"/>	Frequent Heartburn or Indigestion	<input type="checkbox"/>
<input type="checkbox"/> Frequent Headaches	<input type="checkbox"/>	<input type="checkbox"/>	Pain or Stiffness in Your Joints	<input type="checkbox"/>
<input type="checkbox"/> Shortness of Breath	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Pain or Burning on Urination	<input type="checkbox"/>
<input type="checkbox"/> Difficulty in Lying Flat at Night	<input type="checkbox"/>	<input type="checkbox"/>	Difficulty with Urinary Stream	<input type="checkbox"/>
<input type="checkbox"/> Cough or Wheezing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Increased Frequency of Urination	<input type="checkbox"/>
<input type="checkbox"/> Fainting or Dizziness	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Blood in Your Urine	<input type="checkbox"/>

SCREENING HEALTH QUESTIONNAIRE

Please answer the following:

Are you currently taking or have you taken within the last 4 months:

YES

NO

<input type="checkbox"/> Birth Control Pills	<input type="checkbox"/>
<input checked="" type="checkbox"/> Aspirin	<input type="checkbox"/>
<input type="checkbox"/> Antibiotics	<input type="checkbox"/>
<input type="checkbox"/> Mineral Oil	<input type="checkbox"/>
<input type="checkbox"/> Tranquillizers	<input type="checkbox"/>
<input type="checkbox"/> Laxatives	<input type="checkbox"/>
<input type="checkbox"/> Vitam	<input type="checkbox"/>
<input type="checkbox"/> Sleeping Medicine	<input type="checkbox"/>
<input type="checkbox"/> Sulfas	<input type="checkbox"/>
<input type="checkbox"/> Thyroid Med	<input type="checkbox"/>
<input type="checkbox"/> Estrogens	<input type="checkbox"/>
<input checked="" type="checkbox"/> Cold or Cough Medicines	<input type="checkbox"/>
<input type="checkbox"/> Anti-Coagulants	<input type="checkbox"/>
<input type="checkbox"/> Weight Control Medicines	<input type="checkbox"/>

If you checked "Yes" for any of the above medicines please list names, doses (if known) and duration of therapy.

<u>Aspirin</u>	Dose <u>1 tablet 4 times a day</u>	Duration <u>2 weeks</u>
<u>Aspirin</u>	Dose <u>1 tablet 4 times a day</u>	Duration <u>2 weeks</u>
<u></u>	Dose <u></u>	Duration <u></u>
<u></u>	Dose <u></u>	Duration <u></u>

Please indicate approximate weekly intake for following:

Liquor 100% - 0.50 Drinks/Wk.

Beer 1 - 1 Cans or Bottles/Wk.

Wine 1 - 1 Glasses/Wk.

Cigarettes Day

PHYSICAL EXAMINATION FORM

Investigator BAKER Study HAMBARGER-MILKSHAKE

Record all important positive and negative findings.

Date of Examination JUNE 13, 1979 Race C

Name ~~DR. J. W. COLEMAN~~ CMC Age 28 Sex F Weight 115#

Pulse 58 Respiration 16 Blood Pressure 104/72

1. General W/D
2. Skin Normal
3. Eyes N
4. Ears N
5. Nose N
6. Mouth N
7. Throat N
8. Neck N
9. Chest and Lungs N
10. Heart N
11. Abdomen N
12. Genitalia N
13. Lymphatic N
14. Vascular N
15. Locomotion N
16. Extremities N
17. Neurological N

Serge L. Baker
Physician's Signature

057

3/02/1979 2312 HR

PERMANENT
CHART COPY

ID : 60900

PG 1

DR: HP

MS: PED

DOB: 1/01/1952 SEX: F

ROOM: PED

NAME: ~~CECILIA J. CHAMBERLAIN~~ 14

***** H E M A T O L O G Y *****

*BC	RBC	HB	HCT	MCV	MCHC	MCH	PLT
4.3-11.64	4.2-5.6	12.3-16.2	37-49	82-97	32-36	27-32	150-400
K/MM3	MIL/MM3	G/DL	%	CU.MICR	G/DL	PICO-G	K/MM3
MAR 2 6.9	4.73	13.5	39.1	83	34.6	28.6	391
0900R							

***** B L O O D C H E M I S T R Y *****

NA	K	CL	CO2	UREA-N	CREAT	BALANCE
135-145	3.5-5.0	95-105	24-32	10-20	.7-1.4	7-20
MEQ/L	MEQ/L	MEQ/L	MMOL/L	MG/DL	MG/DL	MEQ/L
MAR 2 142	4.2	110*	19*	15	1.0	13
0900R		CKD				

T-PROT	ALB	CA	PO4	CHOL	GLUC	UREA-N	URIC
6.0-8.0	3.5-5.0	8.5-10.5	2.5-4.5	130-315	65-110	10-20	2.5-8.0
G/DL	G/DL	MG/DL	MG/DL	MG/DL	MG/DL	MG/DL	MG/DL
MAR 2 7.5	4.1	9.1	4.1	248	82	15	4.1
0900R							

LDH-T	SGOT	BILI-T	ALK-P
100-225	7.5-40.0	26-1.00	30-115
IU/L	IU/L	MG/DL	IU/L
MAR 2 140	16	1.2*	44
0900R			

CHECKED

Cmc

ESBET-CHART 061

UNIVERSITY OF IOWA HOSPITALS AND CLINICS

END OF REPORT

058

PG 1

0-4 MISCELLANEOUS REQUEST
UNIVERSITY OF IOWA HOSPITALS AND CLINICS

EKG LAB. 0928	IMMUNOPATH LAB. RM 385 MRC	CLIN PHARMACOLOGY AND TOXICOLOGY RM 260 MRC
HEMATOLOGY LAB.	RADIOBIOASSY SPECIAL CHEM RM 260 - MRC	RESULTS PHONED
PULMONARY FUNCT.	BLOOD BANK	<input type="checkbox"/> EMERGENCY
G.I. ENDOSCOPY	THROMBOSIS LAB	<input checked="" type="checkbox"/> ROUTINE

DATE 3-2-79 CMC
NAME ~~Shirley M. ...~~
ADDRESS Iowa City
AGE 27
HOSP NO Charge Q611
IND. ☐ IN ☐ OUT CL. PAY ☐ IN ☐ OUT PVT. ☐ IN ☐ OUT RESEARCH ACCT NO

REQUEST: PREGNANCY TEST
Not Pregnant

AGNOSIS: SIGNED: L.J. Filer SERVICE: Peds

DR EKG-HEIGHT WEIGHT: BP: DIGITALIS? QUINIDINE? OTHER?

Pregnosticon- Negative

CHART COPY

70569

Project entitled: "Hamburger/Milkshake"

Dialogue with Human Volunteers

We are interested in studying the rate of absorption of the amino acid, glutamic acid, when administered as monosodium glutamate at a dose of 150 mg per kg body weight in the fasting state. We are also interested in studying the dipeptide, aspartame (at 23 mg/kg), given in conjunction with the monosodium glutamate ingested with hamburger. The aspartame will be part of a milkshake.

This is a cross-over type of experiment in which you will go through the procedure three times. You will receive:

- a) Hamburger with no MSG plus a milkshake with no aspartame;
- b) Hamburger with MSG plus a milkshake with no aspartame;
- c) Hamburger with MSG plus a milkshake with aspartame.

The study will be carried out in the Pediatric Outpatient Clinic on the first floor of University Hospitals. You will be asked to report there at 0730 hours, having fasted from midnight. A needle will be placed in a forearm vein so that timed blood samples can be removed without repeated venipunctures. Two or 3 cc of a dilute heparin solution will be instilled into the needle between the removal of blood samples to prevent clotting. Blood samples 5 ml in volume will be obtained at 0, 15, 30, 45, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes after ingestion of the meal. The total volume of blood to be removed is less than 4 ozs.

A brief medical history and physical examination will be performed on each subject. Each participant will receive a urinalysis and an SMA 12/60, 6/60. All women will provide an a.m. urine specimen for pregnancy testing. Each participant will be asked to forego alcohol and other drug ingestion for a period of 24 hours prior to testing.

Discomforts attendant to the procedure will be that of hunger, since food will be restricted other than the test meal to be provided at 0800 hours. The other discomfort is that associated with venipuncture, which should be limited to one such procedure. Confinement in the test area during the time of blood withdrawal and associated boredom will be a source of annoyance.

You are obviously free to withdraw from the project at any time without prejudice. Since the design of the project calls for establishing the response of each subject to three test situations, you will be paid \$150 for the completion of the total study. Since failure to complete the three tests invalidates the use of any one subject, withdrawal prior to completion of the study design will result in only partial payment of the allocated fee (\$50 per 8 hour study).

There are no identifiable benefits to you; however, these studies will permit us to establish what influence if any the administration of amino acids or a dipeptide produce in a plasma aminogram when given in conjunction with a meal and beverage.

Hamburger/Milkshake

Page 2

I have discussed the above points with the subject or his legally authorized representative using a translator if necessary. It is my opinion that the subject understands the risks, benefits, and obligations involved in participation in this project.


Investigator

SCREENING HEALTH QUESTIONNAIRE

(CLINICAL STUDIES -- NORMAL SUBJECTS)

Name ~~XXXXXXXXXX~~ SH Date 4-12-79

Sex M Birthdate 2/1/55

Place a check in front of each item if any relative has had the following:

Indicate relationship after each item using these code letters

Mother - M

Father - F

Aunt - A

Uncle - U

Brother - B

Sister - S

<input type="checkbox"/>	Allergies	<input type="checkbox"/>	Tuberculosis
<input type="checkbox"/>	Asthma or Hay Fever	<input type="checkbox"/>	Gout
<input type="checkbox"/>	Anemia	<input type="checkbox"/>	Heart Trouble
<input type="checkbox"/>	Cancer or Tumor	<input type="checkbox"/>	Stroke
<input type="checkbox"/>	Diabetes	<input type="checkbox"/>	High Blood Pressure
<input type="checkbox"/>	Bleeding Problem	<input type="checkbox"/>	Kidney Trouble
<input type="checkbox"/>	Epilepsy (Convulsions)	<input type="checkbox"/>	Arthritis
<input type="checkbox"/>	Glaucoma	<input type="checkbox"/>	Ulcer

Place a check in front of each item if you now have or have ever had any of the following:

<input type="checkbox"/> Diabetes	<input type="checkbox"/> Arthritis	<input type="checkbox"/> Yellow Jaundice
<input type="checkbox"/> Hives or Skin Rashes	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Malaria
<input type="checkbox"/> Chest Disease	<input type="checkbox"/> Gout	<input type="checkbox"/> Venereal Disease
<input type="checkbox"/> Eye Disease	<input checked="" type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> Polio
<input type="checkbox"/> Liver Disease	<input type="checkbox"/> Pancreatitis	<input type="checkbox"/> Dental Problems
<input type="checkbox"/> Neuralgia or Neuritis	<input type="checkbox"/> Thyroid Disease	<input type="checkbox"/> Tuberculosis
<input type="checkbox"/> Any Serious Accidents	<input type="checkbox"/> Rheumatic Fever	<input type="checkbox"/> Kidney Trouble
<input type="checkbox"/> Any Surgery	<input type="checkbox"/> Scarlet Fever	<input type="checkbox"/> Cancer or Tumor
<input type="checkbox"/> Hospitalizations	<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Stroke
<input type="checkbox"/> Heart Trouble	<input type="checkbox"/> Anemia	<input type="checkbox"/> Menstrual Disorders
<input type="checkbox"/> Mononucleosis		

List Any Other Illness _____

If you have checked any of the above spaces or listed any other illness, please record below

Illness or Operation	Month and Yr.	Hospitalized	If yes, how long?
<u>Scarlet fever</u>	<u>1920</u>	Yes <u> </u> No <u> </u>	<u> </u> mos. <u> </u> wks. <u> </u> day
<u>Measles</u>	<u>1922-1923</u>	Yes <u> </u> No <u> </u>	<u> </u> mos. <u> </u> wks. <u> </u> day
<u>Scarlet fever</u>	<u>1923-1924 after</u>	Yes <u> </u> No <u> </u>	<u> </u> mos. <u> </u> wks. <u> </u> day
<u> </u>	<u> </u>	Yes <u> </u> No <u> </u>	<u> </u> mos. <u> </u> wks. <u> </u> day

- - 062

SCREENING HEALTH QUESTIONNAIRE

CHECK THE APPROPRIATE SPACE FOR EACH OF THE FOLLOWING QUESTIONS:

Do you or have you ever had:

	No	Yes		No
<input type="checkbox"/> Frequent Eye Infections	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Soaking Night Sweats	<input checked="" type="checkbox"/>
<input type="checkbox"/> Double Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Tightness in Your Chest	<input checked="" type="checkbox"/>
<input type="checkbox"/> Blurred Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Abnormal EKG (Electrocardiogram)	<input checked="" type="checkbox"/>
<input type="checkbox"/> Pain in the Eyes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fluttering of Heart	<input checked="" type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Frequent diarrhea	<input checked="" type="checkbox"/>
<input type="checkbox"/> Cataracts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Frequent Constipation	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Poor Vision	<input type="checkbox"/>	<input type="checkbox"/>	Blood in Your Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Earaches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Black or Tarry Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Ringing in Ears	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Difficulty in Swallowing	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Frequent Nosebleeds	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Frequent Heartburn or Indigestion	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Headaches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pain or Stiffness in Your Joints	<input checked="" type="checkbox"/>
<input type="checkbox"/> Shortness of Breath	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pain or Burning on Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Difficulty in Lying Flat at Night	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Difficulty with Urinary Stream	<input checked="" type="checkbox"/>
<input type="checkbox"/> Cough or Wheezing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Increased Frequency of Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Fainting or Dizziness	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Blood in Your Urine	<input checked="" type="checkbox"/>

SCREENING HEALTH QUESTIONNAIRE

Please answer the following:

Are you currently taking or have you taken within the last 4 months:

YES	NO
<input type="checkbox"/> Birth Control Pills	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Aspirin	<input type="checkbox"/>
<input type="checkbox"/> Antibiotics	<input checked="" type="checkbox"/>
<input type="checkbox"/> Mineral Oil	<input checked="" type="checkbox"/>
<input type="checkbox"/> Tranquilizers	<input checked="" type="checkbox"/>
<input type="checkbox"/> Laxatives	<input checked="" type="checkbox"/>
<input type="checkbox"/> Vitam	<input checked="" type="checkbox"/>
<input type="checkbox"/> Sleeping Medicine	<input checked="" type="checkbox"/>
<input type="checkbox"/> Sulfas	<input checked="" type="checkbox"/>
<input type="checkbox"/> Thyroid Med	<input checked="" type="checkbox"/>
<input type="checkbox"/> Estrogens	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Cold or Cough Medicines	<input type="checkbox"/>
<input type="checkbox"/> Anti-Coagulants	<input checked="" type="checkbox"/>
<input type="checkbox"/> Weight Control Medicines	<input checked="" type="checkbox"/>

If you checked "Yes" for any of the above medicines please list names, doses (if known) and duration of therapy.

Aspirin Dose 2 tablets Duration 2 yrs

Nobitusin Dose 1 tablet Duration 1 yr

_____ Dose _____ Duration _____

_____ Dose _____ Duration _____

Please indicate approximate weekly intake for following:

Liquor _____ Drinks/Wk.

Beer 4-5 Cans or Bottles/Wk.

Wine _____ Glasses/Wk.

Cigarettes _____ /Day

PHYSICAL EXAMINATION FORM

Investigator BAKER, G. Study _____

Record all important positive and negative findings.

Date of Examination 5/31/79 Race Cauc

Name ~~SH~~ SH Age 22 Sex M Weight 170 lb
Pulse 60 Respiration 16 Blood Pressure 136/90

1. General W/D W/H
2. Skin N
3. Eyes N - corrected: glasses
4. Ears N
5. Nose N
6. Mouth N
7. Throat N
8. Neck N
9. Chest and Lungs N
10. Heart N
11. Abdomen N
12. Genitalia N
13. Lymphatic N
14. Vascular N
15. Locomotion N
16. Extremities N
17. Neurological N

G. Baker
Physician's Signature

065

4/12/1979 2130 HR

CHART COPY

: 50911

PG

DR: NP

AS: PED

DOB: 1/01/1957 SEX: M

ROOM: RESEAR

NAME: ~~REDACTED~~ SH
25

***** H E M A T O L O G Y *****

WBC	RBC	HB	HCT	MCV	MCHC	MCH	PLT
4.3-11.6	4.7-6.1	14.2-18.0	42-54	82-97	32-36	27-32	150-400
K/MM3	MIL/MM3	G/DL	%	CU.MICH	G/DL	PICO-G	K/MM3
APR 12 0900R 4.6	4.95	15.5	43.1	87	35.9	31.2	243

***** B L O O D C H E M I S T R Y *****

NA	K	CL	CO2	UREA-N	CHEAT	BALANCE
135-145	3.5-5.0	95-105	24-32	10-20	.7-1.4	7-20
MEQ/L	MEQ/L	MEQ/L	MMOL/L	MG/DL	MG/DL	MEQ/L
APR 12 0900R 140	4.3	105	24	15	.9	11

T-PROT	ALB	CA	PU4	CHOL	GLUC	UREA-N	URIC
6.0-8.0	3.5-5.0	8.5-10.5	2.5-4.5	130-315	65-110	10-20	2.5-8.0
G/DL	G/DL	MG/DL	MG/DL	MG/DL	MG/DL	MG/DL	MG/DL
APR 12 0900R 7.4	4.7	10.0	4.4	177	87	ITX	6.3

LDH-T	SGOT	BILI-T	ALK-P
100-225	7.5-40.0	.26-1.00	30-115
IU/L	IU/L	MG/DL	IU/L
APR 12 0900R 176	19	.7	58

ITX INSTRUMENT TROUBLE

UNIVERSITY OF IOWA HOSPITALS AND CLINICS

066

HUPP ~~REDACTED~~ SH

END OF REPORT

PG 1

4/12/1979 2130 MF

CHART COPY

NO : 51415

IN: HP
DUB:

IS: PED
ROOM: RES

DATE: ~~REDACTED~~ 0611
23

SEX : M

***** U R I N A L Y S I S *****

[illegible]

NEG NEGATIVE

~~HO-100-4611~~

UNIVERSITY OF IOWA HOSPITALS AND CLINICS
END OF REPORT

067

Project entitled: "Hamburger/Milkshake"

Dialogue with Human Volunteers

We are interested in studying the rate of absorption of the amino acid, glutamic acid, when administered as monosodium glutamate at a dose of 150 mg per kg body weight in the fasting state. We are also interested in studying the dipeptide, aspartame (at 23 mg/kg), given in conjunction with the monosodium glutamate ingested with hamburger. The aspartame will be part of a milkshake.

This is a cross-over type of experiment in which you will go through the procedure three times. You will receive:

- a) Hamburger with no MSG plus a milkshake with no aspartame;
- b) Hamburger with MSG plus a milkshake with no aspartame;
- c) Hamburger with MSG plus a milkshake with aspartame.

The study will be carried out in the Pediatric Outpatient Clinic on the first floor of University Hospitals. You will be asked to report there at 0730 hours, having fasted from midnight. A needle will be placed in a forearm vein so that timed blood samples can be removed without repeated venipunctures. Two or 3 cc of a dilute heparin solution will be instilled into the needle between the removal of blood samples to prevent clotting. Blood samples 5 ml in volume will be obtained at 0, 15, 30, 45, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes after ingestion of the meal. The total volume of blood to be removed is less than 4 ozs.

A brief medical history and physical examination will be performed on each subject. Each participant will receive a urinalysis and an SMA 12/60, 6/60. All women will provide an a.m. urine specimen for pregnancy testing. Each participant will be asked to forego alcohol and other drug ingestion for a period of 24 hours prior to testing.

Discomforts attendant to the procedure will be that of hunger, since food will be restricted other than the test meal to be provided at 0800 hours. The other discomfort is that associated with venipuncture, which should be limited to one such procedure. Confinement in the test area during the time of blood withdrawal and associated boredom will be a source of annoyance.

You are obviously free to withdraw from the project at any time without prejudice. Since the design of the project calls for establishing the response of each subject to three test situations, you will be paid \$150 for the completion of the total study. Since failure to complete the three tests invalidates the use of any one subject, withdrawal prior to completion of the study design will result in only partial payment of the allocated fee (\$50 per 8 hour study).

There are no identifiable benefits to you; however, these studies will permit us to establish what influence if any the administration of amino acids or a dipeptide produce in a plasma aminogram when given in conjunction with a meal and beverage.

Hamburger/Milkshake

Page 2

I have discussed the above points with the subject or his legally authorized representative using a translator if necessary. It is my opinion that the subject understands the risks, benefits, and obligations involved in participation in this project.


Investigator

069

SCREENING HEALTH QUESTIONNAIRE
(CLINICAL STUDIES -- NORMAL SUBJECTS)

Name ~~XXXXXXXXXXXX~~ GI Date 4-12-79
Sex F Birthdate 8/27/54

Place a check in front of each item if any relative has had the following:

Indicate relationship after each item using these code letters

Mother - M Father - F Aunt - A
Uncle - U Brother - B Sister - S

<input type="checkbox"/> Allergies	<input type="checkbox"/>	<input type="checkbox"/> Tuberculosis	<input type="checkbox"/>
<input checked="" type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> F	<input type="checkbox"/> Gout	<input type="checkbox"/>
<input type="checkbox"/> Anemia	<input type="checkbox"/>	<input type="checkbox"/> Heart Trouble	<input type="checkbox"/>
<input checked="" type="checkbox"/> Cancer or Tumor	<input type="checkbox"/> F	<input type="checkbox"/> Stroke	<input type="checkbox"/>
<input type="checkbox"/> Diabetes	<input type="checkbox"/>	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/>
<input type="checkbox"/> Bleeding Problem	<input type="checkbox"/>	<input checked="" type="checkbox"/> Kidney Trouble	<input type="checkbox"/> F M
<input type="checkbox"/> Epilepsy (Convulsions)	<input type="checkbox"/>	<input type="checkbox"/> Arthritis	<input type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input type="checkbox"/>	<input type="checkbox"/> Ulcer	<input type="checkbox"/>

Place a check in front of each item if you now have or have ever had any of the following:

<input type="checkbox"/> Diabetes	<input type="checkbox"/> Arthritis	<input type="checkbox"/> Yellow Jaundice
<input type="checkbox"/> Hives or Skin Rashes	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Malaria
<input type="checkbox"/> Chest Disease	<input type="checkbox"/> Gout	<input type="checkbox"/> Venereal Disease
<input type="checkbox"/> Eye Disease	<input checked="" type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> Polio
<input type="checkbox"/> Liver Disease	<input type="checkbox"/> Pancreatitis	<input type="checkbox"/> Dental Problems
<input type="checkbox"/> Neuralgia or Neuritis	<input type="checkbox"/> Thyroid Disease	<input type="checkbox"/> Tuberculosis
<input type="checkbox"/> Any Serious Accidents	<input type="checkbox"/> Rheumatic Fever	<input type="checkbox"/> Kidney Trouble
<input type="checkbox"/> Any Surgery	<input type="checkbox"/> Scarlet Fever	<input type="checkbox"/> Cancer or Tumor
<input type="checkbox"/> Hospitalizations	<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Stroke
<input type="checkbox"/> Heart Trouble	<input type="checkbox"/> Anemia	<input type="checkbox"/> Menstrual Disorders
<input type="checkbox"/> Mononucleosis		

List Any Other Illness _____

If you have checked any of the above spaces or listed any other illness, please record below

Illness or Operation	Month and Yr.	Hospitalized	If yes, how long?
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ day
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ day
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ day
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ day

070

SCREENING HEALTH QUESTIONNAIRE

CHECK THE APPROPRIATE SPACE FOR EACH OF THE FOLLOWING QUESTIONS:

Do you or have you ever had:

Yes	No	Yes	No
<input type="checkbox"/> Frequent Eye Infections	<input checked="" type="checkbox"/>	<input type="checkbox"/> Soaking Night Sweats	<input checked="" type="checkbox"/>
<input type="checkbox"/> Double Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/> Tightness in Your Chest	<input checked="" type="checkbox"/>
<input type="checkbox"/> Blurred Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/> Abnormal EKG (Electrocardiogram)	<input checked="" type="checkbox"/>
<input type="checkbox"/> Pain in the Eyes	<input checked="" type="checkbox"/>	<input type="checkbox"/> Fluttering of Heart	<input checked="" type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input checked="" type="checkbox"/>	<input type="checkbox"/> Frequent diarrhea	<input checked="" type="checkbox"/>
 <input type="checkbox"/> Cataracts	 <input checked="" type="checkbox"/>	 <input type="checkbox"/> Frequent Constipation	 <input checked="" type="checkbox"/>
<input type="checkbox"/> Poor Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/> Blood in Your Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Earaches	<input checked="" type="checkbox"/>	<input type="checkbox"/> Black or Tarry Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Ringing in Ears	<input checked="" type="checkbox"/>	<input type="checkbox"/> Difficulty in Swallowing	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Nosebleeds	<input checked="" type="checkbox"/>	<input type="checkbox"/> Frequent Heartburn or Indigestion	<input checked="" type="checkbox"/>
 <input type="checkbox"/> Frequent Headaches	 <input checked="" type="checkbox"/>	 <input type="checkbox"/> Pain or Stiffness in Your Joints	 <input checked="" type="checkbox"/>
<input type="checkbox"/> Shortness of Breath	<input checked="" type="checkbox"/>	<input type="checkbox"/> Pain or Burning on Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Difficulty in Lying Flat at Night	<input checked="" type="checkbox"/>	<input type="checkbox"/> Difficulty with Urinary Stream	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Cough or Wheezing	<input checked="" type="checkbox"/>	<input type="checkbox"/> Increased Frequency of Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Fainting or Dizziness	<input checked="" type="checkbox"/>	<input type="checkbox"/> Blood in Your Urine	<input checked="" type="checkbox"/>

SCREENING HEALTH QUESTIONNAIRE

Please answer the following:

Are you currently taking or have you taken within the last 4 months:

YES

NO

☐ Birth Control Pills
☐ Aspirin
☐ Antibiotics
☐ Mineral Oil
☐ Tranquillizers
☐ Laxatives
☐ Vitam
☐ Sleeping Medicine
☐ Sulfas
☐ Thyroid Med
☐ Estrogens
☐ Cold or Cough Medicines
☐ Anti-Coagulants
☐ Weight Control Medicines

☒
☒
☒
☐
☐
☐
☐
☐
☒
☐
☐
☒
☒
☒

If you checked "Yes" for any of the above medicines please list names, doses (if known) and duration of therapy.

_____ Dose _____ Duration _____
 _____ Dose _____ Duration _____
 _____ Dose _____ Duration _____
 _____ Dose _____ Duration _____

Please indicate approximate weekly intake for following:

Liquor _____ Drinks/Wk.
 Beer _____ Cans or Bottles/Wk.
 Wine _____ 1-2 Glasses/Wk.
 Cigarettes _____ /Day

PHYSICAL EXAMINATION FORM

Investigator FILER BAKER - STEGINK Study MSG- ASPARTAME HAMBURGER SMILKSHAKE

Record all important positive and negative findings.

Date of Examination 6/27/79 Race C
 Name [REDACTED] GI Age 24 Sex F Weight 54 1/2
 Pulse 92 Respiration 16 Blood Pressure 110/70

1. General GOOD
2. Skin Clear
3. Eyes PERILAR LACRIM'S INTACT
4. Ears OK
5. Nose OK
6. Mouth NO CAVITIES
7. Throat OK
8. Neck OK
9. Chest and Lungs Clear
10. Heart CR
11. Abdomen OK
12. Genitalia OK
13. Lymphatic OK
14. Vascular OK
15. Locomotion OK
16. Extremities OK
17. Neurological OK

Physician's Signature

073

CONSOLIDATED LABORATORY RESULTS

4/12/1979 2130 HR

CHART COPY

H# : 51815

PG

GI

DR: NP

NS: 0611

NAME: ~~XXXXXXXXXX~~

35

DOB: 1/01/1955 SEX : M

ROOM: PED

***** B L O O D C H E M I S T R Y *****

HA	K	CL	CO2	UREA-N	CREAT	BALANCE
135-145	3.5-5.0	95-105	24-32	10-20	.7-1.4	7-20
MEQ/L	MEQ/L	MEQ/L	MMOL/L	MG/DL	MG/DL	MEQ/L
APR 12 143	4.0	105	25	22*	.9	13
1815R						

T-PROT	ALB	CA	PO4	CHOL	GLUC	UREA-N	URIC
6.0-9.0	3.5-5.0	8.5-10.5	2.5-4.5	130-315	65-110	10-20	2.5-8.0
G/DL	G/DL	MG/DL	MG/DL	MG/DL	MG/DL	MG/DL	MG/DL
APR 12 7.5	4.4	9.6	3.7	165	65	23*	5.1
1815R							

LDH-T	SGOT	BILI-T	ALK-P
100-225	7.5-40.0	.26-1.00	30-115
IU/L	IU/L	MG/DL	IU/L
APR 12 216	26	.6	63
1815R			

074

GI

UNIVERSITY OF IOWA HOSPITALS AND CLINICS

END OF REPORT

PG 1

פֿאַר אַלע אַרבעטסמאַנן און אַרבעטער

4/12/1979 2131 HP

CHART COPY

14# : 50912

GI

PG

DR: RP

AS: PED

NAME: ~~XXXXXXXXXXXXXXXXXXXX~~

DOB: 1/01/1955 SEX : F

ROOM: RESEAR

25

***** H E M A T O L O G Y *****

[illegible]

UNIVERSITY OF IOWA HOSPITALS AND CLINICS

075

~~IN~~

END OF REPORT

PG

CHART COPY

PG 1

23

U R I N A L Y S I S

PG 1

0-4 MISCELLANEOUS REQUEST
UNIVERSITY OF IOWA HOSPITALS AND CLINICS

EKG LAB 0528	IMMUNOPATH LAB. RM. 385 MRC	CLIN. PHARMACOLOGY AND TOXICOLOGY RM. 260 MRC
HEMATOLOGY LAB.	RADIOBIOASSY SPECIAL CHEM RM. 280 - MRC	RESULTS PHONED
PULMONARY FUNCT.	BLOOD BANK	<input type="checkbox"/> EMERGENCY
G.I. ENDOSCOPY	THROMBOSIS LAB	<input type="checkbox"/> ROUTINE

DATE 04-13-79 GI

NAME ~~XXXXXXXXXX~~

ADDRESS

AGE 24

HOSP. NO.

IND. ☐ IN ☐ OUT

CL. PAY ☐ IN ☐ OUT

PVT. ☐ IN ☐ OUT

RESEARCH

62611

ACCT. NO.

REQUEST: PREGNANCY TEST

DIAGNOSIS: NOT PREGNANT

SIGNED:

H. J. Filer

SERVICE:

PEDS

FOR EKG-HEIGHT

WEIGHT

B.P.

DIGITALIS

QUINIDINE?

OTHER?

Pregnosticon Negative

CHART COPY

82610

Project entitled: "Hamburger/Milkshake"

Dialogue with Human Volunteers

We are interested in studying the rate of absorption of the amino acid, glutamic acid, when administered as monosodium glutamate at a dose of 150 mg per kg body weight in the fasting state. We are also interested in studying the dipeptide, aspartame (at 23 mg/kg), given in conjunction with the monosodium glutamate ingested with hamburger. The aspartame will be part of a milkshake.

This is a cross-over type of experiment in which you will go through the procedure three times. You will receive:

- a) Hamburger with no MSG plus a milkshake with no aspartame;
- b) Hamburger with MSG plus a milkshake with no aspartame;
- c) Hamburger with MSG plus a milkshake with aspartame.

The study will be carried out in the Pediatric Outpatient Clinic on the first floor of University Hospitals. You will be asked to report there at 0730 hours, having fasted from midnight. A needle will be placed in a forearm vein so that timed blood samples can be removed without repeated venipunctures. Two or 3 cc of a dilute heparin solution will be instilled into the needle between the removal of blood samples to prevent clotting. Blood samples 5 ml in volume will be obtained at 0, 15, 30, 45, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes after ingestion of the meal. The total volume of blood to be removed is less than 4 ozs.

A brief medical history and physical examination will be performed on each subject. Each participant will receive a urinalysis and an SMA 12/60, 6/60. All women will provide an a.m. urine specimen for pregnancy testing. Each participant will be asked to forego alcohol and other drug ingestion for a period of 24 hours prior to testing.

Discomforts attendant to the procedure will be that of hunger, since food will be restricted other than the test meal to be provided at 0800 hours. The other discomfort is that associated with venipuncture, which should be limited to one such procedure. Confinement in the test area during the time of blood withdrawal and associated boredom will be a source of annoyance.

You are obviously free to withdraw from the project at any time without prejudice. Since the design of the project calls for establishing the response of each subject to three test situations, you will be paid \$150 for the completion of the total study. Since failure to complete the three tests invalidates the use of any one subject, withdrawal prior to completion of the study design will result in only partial payment of the allocated fee (\$50 per 8 hour study).

There are no identifiable benefits to you; however, these studies will permit us to establish what influence if any the administration of amino acids or a dipeptide produce in a plasma aminogram when given in conjunction with a meal and beverage.

Hamburger/Milkshake

Page 2

I have discussed the above points with the subject or his legally authorized representative using a translator if necessary. It is my opinion that the subject understands the risks, benefits, and obligations involved in participation in this project.


Investigator

SCREENING HEALTH QUESTIONNA
(CLINICAL STUDIES -- NORMAL SUB: S)

Name SG Date APRIL 12, 1979
Sex m Birthdate JUNE 25, 1957

Place a check in front of each item if any relative has had the following:

Indicate relationship after each item using these code letters

Mother - M Father - F Aunt - A
Uncle - U Brother - B Sister - S

<input checked="" type="checkbox"/> Allergies	<input type="checkbox"/>	<input type="checkbox"/> Tuberculosis	<input type="checkbox"/> F
<input checked="" type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> F	<input type="checkbox"/> Gout	<input type="checkbox"/>
<input type="checkbox"/> Anemia	<input type="checkbox"/>	<input type="checkbox"/> Heart Trouble	<input type="checkbox"/>
<input type="checkbox"/> Cancer or Tumor	<input type="checkbox"/>	<input type="checkbox"/> Stroke	<input type="checkbox"/>
<input type="checkbox"/> Diabetes	<input type="checkbox"/>	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> F
<input type="checkbox"/> Bleeding Problem	<input type="checkbox"/>	<input type="checkbox"/> Kidney Trouble	<input type="checkbox"/>
<input type="checkbox"/> Epilepsy (Convulsions)	<input type="checkbox"/>	<input type="checkbox"/> Arthritis	<input type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input type="checkbox"/>	<input type="checkbox"/> Ulcer	<input type="checkbox"/>

Place a check in front of each item if you now have or have ever had any of the following:

<input type="checkbox"/> Diabetes	<input type="checkbox"/> Arthritis	<input type="checkbox"/> Yellow Jaundice
<input type="checkbox"/> Hives or Skin Rashes	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Malaria
<input type="checkbox"/> Chest Disease	<input type="checkbox"/> Gout	<input type="checkbox"/> Venereal Disease
<input type="checkbox"/> Eye Disease	<input checked="" type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> Polio
<input type="checkbox"/> Liver Disease	<input type="checkbox"/> Pancreatitis	<input type="checkbox"/> Dental Problems
<input type="checkbox"/> Neuralgia or Neuritis	<input type="checkbox"/> Thyroid Disease	<input type="checkbox"/> Tuberculosis
<input type="checkbox"/> Any Serious Accidents	<input type="checkbox"/> Rheumatic Fever	<input type="checkbox"/> Kidney Trouble
<input checked="" type="checkbox"/> Any Surgery	<input type="checkbox"/> Scarlet Fever	<input type="checkbox"/> Cancer or Tumor
<input checked="" type="checkbox"/> Hospitalizations	<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Stroke
<input type="checkbox"/> Heart Trouble	<input type="checkbox"/> Anemia	<input type="checkbox"/> Menstrual Disorders
<input type="checkbox"/> Mononucleosis		

List Any Other Illness _____

If you have checked any of the above spaces or listed any other illness, please record below

Illness or Operation	Month and Yr.	Hospitalized	If yes, how long?
<u>Ankle Surgery</u>	<u>Feb 74</u>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<u>1</u> mos. <u>1</u> wks. <u> </u> day
_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	<u> </u> mos. <u> </u> wks. <u> </u> day
_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	<u> </u> mos. <u> </u> wks. <u> </u> day
_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	<u> </u> mos. <u> </u> wks. <u> </u> day

SCREENING HEALTH QUESTIONNAIRE

CHECK THE APPROPRIATE SPACE FOR EACH OF THE FOLLOWING QUESTIONS:

Do you or have you ever had:

Yes	No	Yes	No
<input type="checkbox"/> Frequent Eye Infections	<input checked="" type="checkbox"/>	<input type="checkbox"/> Soaking Night Sweats	<input checked="" type="checkbox"/>
<input type="checkbox"/> Double Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/> Tightness in Your Chest	<input checked="" type="checkbox"/>
<input type="checkbox"/> Blurred Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/> Abnormal EKG (Electrocardiogram)	<input checked="" type="checkbox"/>
<input type="checkbox"/> Pain in the Eyes	<input checked="" type="checkbox"/>	<input type="checkbox"/> Fluttering of Heart	<input checked="" type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input checked="" type="checkbox"/>	<input type="checkbox"/> Frequent diarrhea	<input checked="" type="checkbox"/>
<input type="checkbox"/> Cataracts	<input checked="" type="checkbox"/>	<input type="checkbox"/> Frequent Constipation	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Poor Vision	<input type="checkbox"/>	<input type="checkbox"/> Blood in Your Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Earaches	<input checked="" type="checkbox"/>	<input type="checkbox"/> Black or Tarry Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Ringing in Ears	<input checked="" type="checkbox"/>	<input type="checkbox"/> Difficulty in Swallowing	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Nosebleeds	<input checked="" type="checkbox"/>	<input type="checkbox"/> Frequent Heartburn or Indigestion	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Headaches	<input checked="" type="checkbox"/>	<input type="checkbox"/> Pain or Stiffness in Your Joints	<input checked="" type="checkbox"/>
<input type="checkbox"/> Shortness of Breath	<input checked="" type="checkbox"/>	<input type="checkbox"/> Pain or Burning on Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Difficulty in Lying Flat at Night	<input checked="" type="checkbox"/>	<input type="checkbox"/> Difficulty with Urinary Stream	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Cough or Wheezing	<input type="checkbox"/>	<input type="checkbox"/> Increased Frequency of Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Fainting or Dizziness	<input checked="" type="checkbox"/>	<input type="checkbox"/> Blood in Your Urine	<input checked="" type="checkbox"/>

SCREENING HEALTH QUESTIONNAIRE

Please answer the following:

Are you currently taking or have you taken within the last 4 months:

YES		NO
<input type="checkbox"/>	Birth Control Pills	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Aspirin	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Antibiotics	<input type="checkbox"/>
<input type="checkbox"/>	Mineral Oil	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Tranquilizers	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Laxatives	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Vitam	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Sleeping Medicine	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Sulfas	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Thyroid Med	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Estrogens	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Cold or Cough Medicines	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Anti-Coagulants	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Weight Control Medicines	<input checked="" type="checkbox"/>

If you checked "Yes" for any of the above medicines please list names, doses (if known) and duration of therapy.

<u>Aspirin</u>	Dose	<u>1 tablet</u>	Duration	<u>1 night</u>
<u>Tetracycline</u>	Dose	<u>4 pills/day</u>	Duration	<u>4 days</u>
_____	Dose	_____	Duration	_____
_____	Dose	_____	Duration	_____

Please indicate approximate weekly intake for following:

Liquor	<u>0</u>	Drinks/Wk.
Beer	<u>< 1</u>	Cans or Bottles/Wk.
Wine	<u>< 1</u>	Glasses/Wk.
Cigarettes	<u>0</u>	Day

PHYSICAL EXAMINATION FORM

MILKSHAKE

Investigator FILER, BAKER, STEINIK Study MSG- ASPARTAME HAMBURGER

Record all important positive and negative findings.

Date of Examination 04/13/79 Race ORIENTAL

Time ~~5:00~~ 5G Age Sex M Weight 67.1 Kg
182.3 cm

Pulse 60 Respiration 16 Blood Pressure 106/68 at sitting

General W3 W N

Skin dark mongolian spots post chest

Eyes myopic PERLA EOM's normal

Ears 0

Nose 0

Mouth 0

Throat 0

Neck 0

Chest and Lungs 0

Heart 0

Abdomen 0

Genitalia 0

Lymphatic 0

Vascular 0

Locomotion 0

Extremities 0

Neurological Intact

Physician's Signature

083

CHART COPY

PG

NS: PED
KUM: PED

PAGE: 27

***** U R I N A L Y S I S *****

EG NEGATIVE

END OF REPORT

084

PG 1

4/12/1979 2130 HP

CHART COPY

: 50910

PG :

LF: NP
DUB:

SEX : M

NS: PED
ROOM: RESEAR

NAME: ~~REDACTED~~
25

SG

***** H E M A T O L O G Y *****

	*BC K/MM3	RBC MIL/MM3	HB G/DL	HCT %	MCV CU.MICR	MCHC G/DL	MCH PICG-G	PLT K/MM3
APR 12 0900R	4.5	5.34	16.2	48.4	91	33.5	30.4	207

***** B L O O D C H E M I S T R Y *****

	NA MEQ/L	K MEQ/L	CL MEQ/L	CO2 MMOL/L	UREA-N MG/DL	CREAT MG/DL	BALANCE MEQ/L
APR 12 0900R	143	4.0	107	24	13	1.0	12

	T-PROT G/DL	ALB G/DL	CA MG/DL	PO4 MG/DL	CHOL MG/DL	GLUC MG/DL	UREA-N MG/DL	URIC MG/DL
APR 12 0900R	7.3	4.3	9.5	3.6	143	86	ITX	6.8

	LDH-T IU/L	SGOT IU/L	BILI-T MG/DL	ALK-P IU/L
APR 12 0900R	220	21	2.9	59

ITX INSTRUMENT TROUBLE

UNIVERSITY OF IOWA HOSPITALS AND CLINICS
END OF REPORT

085

PG 1

SG

Project entitled: "Hamburger/Milkshake"

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Hamburger/Milkshake

Page 2

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Investigator

087

SCREENING HEALTH QUESTIONNAIRE
(CLINICAL STUDIES -- NORMAL SUBJECTS)

Name [REDACTED] JS Date APRIL 24th 1976
Sex FEMALE Birthdate JULY 15, 1956

Place a check in front of each item if any relative has had the following:

Indicate relationship after each item using these code letters

Mother - M Father - F Aunt - A
Uncle - U Brother - B Sister - S

<input type="checkbox"/> Allergies	<input type="checkbox"/>	<input type="checkbox"/> Tuberculosis	<input type="checkbox"/>
<input type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/>	<input type="checkbox"/> Gout	<input type="checkbox"/>
<input type="checkbox"/> Anemia	<input type="checkbox"/>	<input type="checkbox"/> Heart Trouble	<input type="checkbox"/>
<input checked="" type="checkbox"/> Cancer or Tumor	<u>A</u>	<input type="checkbox"/> Stroke	<input type="checkbox"/>
<input type="checkbox"/> Diabetes	<input type="checkbox"/>	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/>
<input type="checkbox"/> Bleeding Problem	<input type="checkbox"/>	<input type="checkbox"/> Kidney Trouble	<input type="checkbox"/>
<input type="checkbox"/> Epilepsy (Convulsions)	<input type="checkbox"/>	<input type="checkbox"/> Arthritis	<input type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input type="checkbox"/>	<input type="checkbox"/> Ulcer	<input type="checkbox"/>

Place a check in front of each item if you now have or have ever had any of the following:

<input type="checkbox"/> Diabetes	<input type="checkbox"/> Arthritis	<input type="checkbox"/> Yellow Jaundice
<input type="checkbox"/> Hives or Skin Rashes	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Malaria
<input type="checkbox"/> Chest Disease	<input type="checkbox"/> Gout	<input type="checkbox"/> Venereal Disease
<input type="checkbox"/> Eye Disease	<input type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> Polio
<input type="checkbox"/> Liver Disease	<input type="checkbox"/> Pancreatitis	<input type="checkbox"/> Dental Problems
<input type="checkbox"/> Neuralgia or Neuritis	<input type="checkbox"/> Thyroid Disease	<input type="checkbox"/> Tuberculosis
<input type="checkbox"/> Any Serious Accidents	<input type="checkbox"/> Rheumatic Fever	<input checked="" type="checkbox"/> Kidney Trouble
<input type="checkbox"/> Any Surgery	<input type="checkbox"/> Scarlet Fever	<input type="checkbox"/> Cancer or Tumor
<input checked="" type="checkbox"/> Hospitalizations	<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Stroke
<input type="checkbox"/> Heart Trouble	<input type="checkbox"/> Anemia	<input type="checkbox"/> Menstrual Disorders
<input type="checkbox"/> Mononucleosis		

List Any Other Illness _____

If you have checked any of the above spaces or listed any other illness, please record below

Illness or Operation	Month and Yr.	Hospitalized	If yes, how long?
<u>PYELONEPHRITIS</u>	<u>1959</u>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<u>about 4 1/2 mos.</u> <u>1</u> wks. <u>0</u> day
_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____ mos. _____ wks. _____ day
_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____ mos. _____ wks. _____ day
_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____ mos. _____ wks. _____ day

088

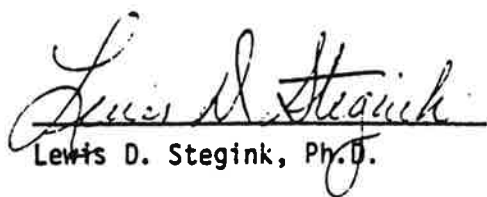
METABOLIC STUDIES OF ASPARTAME AND MONOSODIUM GLUTAMATE INGESTED AS
COMPONENTS OF A HAMBURGER--MILK SHAKE MEAL SYSTEM IN NORMAL ADULT
SUBJECTS

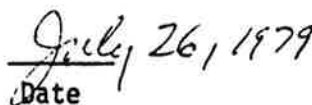
July 26, 1979

A REPORT TO THE G. D. SEARLE COMPANY, SKOKIE, ILL.

FROM:

Lewis D. Stegink, Ph.D., L. J. Filer, Jr., M.D., Ph.D., & G. L. Baker, M.D.
The University of Iowa College of Medicine
Iowa City, Iowa 52242


Lewis D. Stegink, Ph.D.


Date

SCREENING HEALTH QUESTIONNAIRE

CHECK THE APPROPRIATE SPACE FOR EACH OF THE FOLLOWING QUESTIONS:

Do you or have you ever had:

Yes	No	Yes	No
<input type="checkbox"/> Frequent Eye Infections	<input checked="" type="checkbox"/>	<input type="checkbox"/> Soaking Night Sweats	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Double Vision	<input type="checkbox"/>	<input type="checkbox"/> Tightness in Your Chest	<input checked="" type="checkbox"/>
<input type="checkbox"/> Blurred Vision	<input checked="" type="checkbox"/>	<input type="checkbox"/> Abnormal EKG (Electrocardiogram)	<input checked="" type="checkbox"/>
<input type="checkbox"/> Pain in the Eyes	<input checked="" type="checkbox"/>	<input type="checkbox"/> Fluttering of Heart	<input checked="" type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input checked="" type="checkbox"/>	<input type="checkbox"/> Frequent diarrhea	<input checked="" type="checkbox"/>
<input type="checkbox"/> Cataracts	<input checked="" type="checkbox"/>	<input type="checkbox"/> Frequent Constipation	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Poor Vision	<input type="checkbox"/>	<input type="checkbox"/> Blood in Your Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Frequent Earaches	<input checked="" type="checkbox"/>	<input type="checkbox"/> Black or Tarry Stools	<input checked="" type="checkbox"/>
<input type="checkbox"/> Ringing in Ears	<input checked="" type="checkbox"/>	<input type="checkbox"/> Difficulty in Swallowing	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Frequent Nosebleeds	<input type="checkbox"/>	<input type="checkbox"/> Frequent Heartburn or Indigestion	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Frequent Headaches	<input type="checkbox"/>	<input type="checkbox"/> Pain or Stiffness in Your Joints	<input checked="" type="checkbox"/>
<input type="checkbox"/> Shortness of Breath	<input checked="" type="checkbox"/>	<input type="checkbox"/> Pain or Burning on Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Difficulty in Lying Flat at Night	<input checked="" type="checkbox"/>	<input type="checkbox"/> Difficulty with Urinary Stream	<input checked="" type="checkbox"/>
<input type="checkbox"/> Cough or Wheezing	<input checked="" type="checkbox"/>	<input type="checkbox"/> Increased Frequency of Urination	<input checked="" type="checkbox"/>
<input type="checkbox"/> Fainting or Dizziness	<input checked="" type="checkbox"/>	<input type="checkbox"/> Blood in Your Urine	<input checked="" type="checkbox"/>

SCREENING HEALTH QUESTIONNAIRE

Please answer the following:

Are you currently taking or have you taken within the last 4 months:

YES		NO
<input checked="" type="checkbox"/>	Birth Control Pills	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Aspirin	<input type="checkbox"/>
<input type="checkbox"/>	Antibiotics	<input type="checkbox"/>
<input type="checkbox"/>	Mineral Oil	<input type="checkbox"/>
<input type="checkbox"/>	Tranquilizers	<input type="checkbox"/>
<input type="checkbox"/>	Laxatives	<input type="checkbox"/>
<input type="checkbox"/>	Vitam	<input type="checkbox"/>
<input type="checkbox"/>	Sleeping Medicine	<input type="checkbox"/>
<input type="checkbox"/>	Sulfas	<input type="checkbox"/>
<input type="checkbox"/>	Thyroid Med	<input type="checkbox"/>
<input type="checkbox"/>	Estrogens	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Cold or Cough Medicines	<input type="checkbox"/>
<input type="checkbox"/>	Anti-Coagulants	<input type="checkbox"/>
<input type="checkbox"/>	Weight Control Medicines	<input type="checkbox"/>

If you checked "Yes" for any of the above medicines please list names, doses (if known) and duration of therapy.

ORTHO NOVUM Dose _____ Duration 3 yrs.
Aspirin Dose _____ Duration _____
Cough Syrup Dose 2 tsp/night Duration 2 days
 _____ Dose _____ Duration _____

Please indicate approximate weekly intake for following:

Liquor _____ 0 Drinks/Wk.
 Beer _____ 0 Cans or Bottles/Wk.
 Wine _____ 0 Glasses/Wk.
 Cigarettes _____ 0 /Day

PHYSICAL EXAMINATION FORM

Investigator _____ Study _____

Record all important positive and negative findings.

Date of Examination _____ Race _____

Name [REDACTED] JS Age 22 Sex F Weight 135 lb

Pulse 80 Respiration 20 Blood Pressure 120/70

1. General Health good
2. Skin Powdered
3. Eyes Very good. PERRLA
4. Ears RTM OK Cerumen Left
5. Nose nasal septum
6. Mouth Tongue midline. No thrush
7. Throat (unilateral)
8. Neck Thyroid - normal
9. Chest and Lungs clear to P.
10. Heart no mur. Regular rhythm
11. Abdomen Scaphoid S&P
12. Genitalia conf.
13. Lymphatic Ref. nodes. Post conf.
14. Vascular (?? phlebitis) - tender vein R. arm
15. Locomotion conf.
16. Extremities conf.
17. Neurological Reflexes physical

Physician's Signature

091

COMBUSTION MECHANISM RESULTS

4/24/1979 2236 HR

**PERMANENT
CHART COPY**

HB : 31130 JS

PG :

DR: NP
DOB:

NS: POC
ROCM: RES

NAME: [REDACTED]
13

SEX : F

***** H E M A T O L O G Y *****

[illegible]

JS

UNIVERSITY OF IOWA HOSPITALS AND CLINICS
END OF REPORT

09?

PG 1

4/25/1979 2353 HR

CHART COPY

HF : 31405 TS PG 1

DR: NP
DOB:

SEX : F

NS: PED
ROOM: RES

NAME: [REDACTED] 0611
23

***** URINALYSIS *****

[illegible]

1: NEGATIVE JS

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END OF REPORT

093

PG 1

EKG LAB 0520	IMF/NOPATH LAB RM 385 MRC	CLIN PHARMACOLOGY AND TOXICOLOGY RM 280 MRC
HEMATOLOGY LAB	RADIOASSAY SPECIAL CHEM RM 280 - MRC	RESULTS PHONED
PULMONARY FUNCT	BLOOD BANK	<input type="checkbox"/> EMERGENCY
G.I. ENDOSCOPY	THROMBOSIS LAB	<input checked="" type="checkbox"/> ROUTINE

DATE 04- -79 JS
NAME [REDACTED]
ADDRESS [REDACTED]
AGE 22
HOSP. NO.
IND. IN OUT CL PAY IN OUT PVT IN OUT RESEARCH Q611
ACT NO.

INOSIS NOT PREGNANCY SIGNED *[Signature]* SERVICE *[Signature]*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Regresión
Negativa

CHART COPY

82644

HEALTHY		<input checked="" type="checkbox"/> Routine		<input checked="" type="checkbox"/> CBC	
DR. CODE B206		<input type="checkbox"/> Finish Today		<input type="checkbox"/> DIFFERENTIAL	
TECH. CODE B206		<input type="checkbox"/> Emergency		<input type="checkbox"/> PLATELET	
Call Location		<input type="checkbox"/> RETIC		<input type="checkbox"/> SED. RATE	
Poc		Differential WBC		3000	
TEST		Neu. Segs		%	
WBC x 10 ³		Neu. Bands			
RBC x 10 ⁶		Neu. Metamyelocytes			
HGB gm		Neu. Myelocytes			
HCT %		Promyelocytes			
MCV fL		Blasts			
MCH g		Eosinophils			
MCHC %		Basophils			
Platelets x 10 ³		Lymphocytes			
Relic %		Monocytes			
ESR mm/hr		RBC Morphology			
Comments:		Normal			
CHARGE Q611		Hydrochromasia			
DATE 04-24-79		Polkilocytosis			
HOSP. NO. 56-09454		Anisocytosis			
NAME XXXXXXXXXX 55		Schistocytes			
AGE 22		Target Cells			
ADDRESS IOWA CITY IOWA		Basophilic Stippling			
		Howell-Jolly Bodies			
		Nucleated RBC			

094

Project entitled: "Hamburger/Milkshake"

Dialogue with Human Volunteers

We are interested in studying the rate of absorption of the amino acid, glutamic acid, when administered as monosodium glutamate at a dose of 150 mg per kg body weight in the fasting state. We are also interested in studying the dipeptide, aspartame (at 23 mg/kg), given in conjunction with the monosodium glutamate ingested with hamburger. The aspartame will be part of a milkshake.

This is a cross-over type of experiment in which you will go through the procedure three times. You will receive:

- a) Hamburger with no MSG plus a milkshake with no aspartame;
- b) Hamburger with MSG plus a milkshake with no aspartame;
- c) Hamburger with MSG plus a milkshake with aspartame.

The study will be carried out in the Pediatric Outpatient Clinic on the first floor of University Hospitals. You will be asked to report there at 0730 hours, having fasted from midnight. A needle will be placed in a forearm vein so that timed blood samples can be removed without repeated venipunctures. Two or 3 cc of a dilute heparin solution will be instilled into the needle between the removal of blood samples to prevent clotting. Blood samples 5 ml in volume will be obtained at 0, 15, 30, 45, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes after ingestion of the meal. The total volume of blood to be removed is less than 4 ozs.

A brief medical history and physical examination will be performed on each subject. Each participant will receive a urinalysis and an SMA 12/60, 6/60. All women will provide an a.m. urine specimen for pregnancy testing. Each participant will be asked to forego alcohol and other drug ingestion for a period of 24 hours prior to testing.

Discomforts attendant to the procedure will be that of hunger, since food will be restricted other than the test meal to be provided at 0800 hours. The other discomfort is that associated with venipuncture, which should be limited to one such procedure. Confinement in the test area during the time of blood withdrawal and associated boredom will be a source of annoyance.

You are obviously free to withdraw from the project at any time without prejudice. Since the design of the project calls for establishing the response of each subject to three test situations, you will be paid \$150 for the completion of the total study. Since failure to complete the three tests invalidates the use of any one subject, withdrawal prior to completion of the study design will result in only partial payment of the allocated fee (\$50 per 8 hour study).

There are no identifiable benefits to you; however, these studies will permit us to establish what influence if any the administration of amino acids or a dipeptide produce in a plasma aminogram when given in conjunction with a meal and beverage.

Hamburger/Milkshake

Page 2

I have discussed the above points with the subject or his legally authorized representative using a translator if necessary. It is my opinion that the subject understands the risks, benefits, and obligations involved in participation in this project.


Investigator

SCREENING HEALTH QUESTIONNAIRE
(CLINICAL STUDIES -- NORMAL SUBJECTS)

Name

[REDACTED]

KG

Date

7-24-54

Sex

M

Birthdate

7-24-54

Place a check in front of each item if any relative has had the following:

Indicate relationship after each item using these code letters

Mother - M

Father - F

Aunt - A

Uncle - U

Brother - B

Sister - S

<input type="checkbox"/> Allergies	_____	<input type="checkbox"/> Tuberculosis	_____
<input type="checkbox"/> Asthma or Hay Fever	_____	<input type="checkbox"/> Gout	_____
<input type="checkbox"/> Anemia	_____	<input type="checkbox"/> Heart Trouble	_____
<input type="checkbox"/> Cancer or Tumor	_____	<input type="checkbox"/> Stroke	_____
<input type="checkbox"/> Diabetes	_____	<input type="checkbox"/> High Blood Pressure	_____
<input type="checkbox"/> Bleeding Problem	_____	<input type="checkbox"/> Kidney Trouble	_____
<input type="checkbox"/> Epilepsy (Convulsions)	_____	<input type="checkbox"/> Arthritis	_____
<input type="checkbox"/> Glaucoma	_____	<input type="checkbox"/> Ulcer	_____

Place a check in front of each item if you now have or have ever had any of the following:

<input type="checkbox"/> Diabetes	<input type="checkbox"/> Arthritis	<input type="checkbox"/> Yellow Jaundice
<input type="checkbox"/> Hives or Skin Rashes	<input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> Malaria
<input type="checkbox"/> Chest Disease	<input type="checkbox"/> Gout	<input type="checkbox"/> Venereal Disease
<input type="checkbox"/> Eye Disease	<input type="checkbox"/> Asthma or Hay Fever	<input type="checkbox"/> Polio
<input type="checkbox"/> Liver Disease	<input type="checkbox"/> Pancreatitis	<input type="checkbox"/> Dental Problems
<input type="checkbox"/> Neuralgia or Neuritis	<input type="checkbox"/> Thyroid Disease	<input type="checkbox"/> Tuberculosis
<input type="checkbox"/> Any Serious Accidents	<input type="checkbox"/> Rheumatic Fever	<input type="checkbox"/> Kidney Trouble
<input type="checkbox"/> Any Surgery	<input type="checkbox"/> Scarlet Fever	<input type="checkbox"/> Cancer or Tumor
<input type="checkbox"/> Hospitalizations	<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Stroke
<input type="checkbox"/> Heart Trouble	<input type="checkbox"/> Anemia	<input type="checkbox"/> Menstrual Disorders
<input type="checkbox"/> Mononucleosis		

Any Other Illness _____

If you have checked any of the above spaces or listed any other illness, please record below:

Illness or Operation	Month and Yr.	Hospitalized	If yes, how long?
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ da
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ da
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ da
_____	_____	Yes _____ No _____	_____ mos. _____ wks. _____ da

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SCREENING HEALTH QUESTIONNAIRE

CHECK THE APPROPRIATE SPACE FOR EACH OF THE FOLLOWING QUESTIONS:

Do you or have you ever had:

Yes	No	Yes		No
<input type="checkbox"/> Frequent Eye Infections	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Soaking Night Sweats	<input type="checkbox"/>
<input type="checkbox"/> Double Vision	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tightness in Your Chest	<input type="checkbox"/>
<input type="checkbox"/> Blurred Vision	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Abnormal EKG (Electrocardiogram)	<input type="checkbox"/>
<input type="checkbox"/> Pain in the Eyes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fluttering of Heart	<input type="checkbox"/>
<input type="checkbox"/> Glaucoma	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Frequent diarrhea	<input type="checkbox"/>
<input type="checkbox"/> Cataracts	<input type="checkbox"/>	<input type="checkbox"/>	Frequent Constipation	<input type="checkbox"/>
<input checked="" type="checkbox"/> Poor Vision	<input type="checkbox"/>	<input type="checkbox"/>	Blood in Your Stools	<input type="checkbox"/>
<input type="checkbox"/> Frequent Earaches	<input type="checkbox"/>	<input type="checkbox"/>	Black or Tarry Stools	<input type="checkbox"/>
<input type="checkbox"/> Ringing in Ears	<input type="checkbox"/>	<input type="checkbox"/>	Difficulty in Swallowing	<input type="checkbox"/>
<input type="checkbox"/> Frequent Nosebleeds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Frequent Heartburn or Indigestion	<input type="checkbox"/>
<input type="checkbox"/> Frequent Headaches	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Pain or Stiffness in Your Joints	<input type="checkbox"/>
<input type="checkbox"/> Shortness of Breath	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Pain or Burning on Urination	<input type="checkbox"/>
<input type="checkbox"/> Difficulty in Lying Flat at Night	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Difficulty with Urinary Stream	<input type="checkbox"/>
<input type="checkbox"/> Cough or Wheezing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Increased Frequency of Urination	<input type="checkbox"/>
<input type="checkbox"/> Fainting or Dizziness	<input type="checkbox"/>	<input type="checkbox"/>	Blood in Your Urine	<input type="checkbox"/>

SCREENING HEALTH QUESTIONNAIRE

Please answer the following:

Are you currently taking or have you taken within the last 4 months:

YES

NO

<input type="checkbox"/>	Birth Control Pills	<input type="checkbox"/>
<input type="checkbox"/>	Aspirin	<input type="checkbox"/>
<input type="checkbox"/>	Antibiotics	<input type="checkbox"/>
<input type="checkbox"/>	Mineral Oil	<input type="checkbox"/>
<input type="checkbox"/>	Tranquilizers	<input type="checkbox"/>
<input type="checkbox"/>	Laxatives	<input type="checkbox"/>
<input type="checkbox"/>	Vitam	<input type="checkbox"/>
<input type="checkbox"/>	Sleeping Medicine	<input type="checkbox"/>
<input type="checkbox"/>	Sulfas	<input type="checkbox"/>
<input type="checkbox"/>	Thyroid Med	<input type="checkbox"/>
<input type="checkbox"/>	Estrogens	<input type="checkbox"/>
<input type="checkbox"/>	Cold or Cough Medicines	<input type="checkbox"/>
<input type="checkbox"/>	Anti-Coagulants	<input type="checkbox"/>
<input type="checkbox"/>	Weight Control Medicines	<input type="checkbox"/>

If you checked "Yes" for any of the above medicines please list names, doses (if known) and duration of therapy.

_____	Dose _____	Duration _____
_____	Dose _____	Duration _____
_____	Dose _____	Duration _____
_____	Dose _____	Duration _____

Please indicate approximate weekly intake for following:

Liquor _____	Drinks/Wk.
Beer _____ 1-2	Cans or Bottles/Wk.
Wine _____ 1-2	Glasses/Wk.
Cigarettes _____ 6	Day

8-1b CLINICAL NOTES

~~XXXXXXXXXX~~ # KG
~~XXXXXXXXXX~~

DATE

HOSP NO.

NAME

BIRTHDATE

ADDRESS

File most recent sheet of this number ON BOTTOM

☐ PVT ☐ CLP ☐ DND
 IF NOT IMPRINTED, PLEASE PRINT HOSP. NO., NAME AND LOCATION

te & sign each entry. Affix to signature: R=resident, S=staff, MS=med. student, N=nurse

dical necessity certification for inpatient hospitalization of this patient is attested to by the admission order appearing hereon.

PEADon. WT. - 81 Kg. *Case* 25 yrs B.D. 7/24/54
Male

11/70 RAritting Blood pressure - *Heart Rate - 66 Resp 14*

W/D W/N thin person.

HEENT - *Norm*

Chest *N*

Heart *N*

Abd - *N*

Neuro - *N*

Ext *N*

No abnormalities noted

George Z Baker MD

100

(continue on other side)

DX. HEALTHY
 DR. CODE B206
 TECH. CODE DR. FILGEL

☒ Routine
☐ Finish Today
☐ Emergency
 Cell Ext. PEP/OPD
 Location PEP/OPD

☒ CBC
☐ DIFFERENTIAL
☐ PLATELET
☐ RETIC
☐ SED. RATE

Differential WBC 0920R

TEST	DIFFERENTIAL WBC
WBC $\times 10^3$	Neut. Segs %
RBC $\times 10^6$	Neut. Bands
HGB gm	Neut. Metamyelocytes
HCT %	Neut. Myelocytes
MCV μ^3	Promyelocytes
MCH μ^3	Blasts
MCHC %	Eosinophils
Platelets $\times 10^3$	Basophils
Retic %	Lymphocytes
ESR mm/hr	Monocytes
	RBC Morphology
	Normal
	Hypochromia
	Polychromasia
	Poikilocytosis
	Anisocytosis
	Schistocytes
	Target Cells
	Basophilic Stippling
	Howell-Jolly Bodies
	Nucleated RBC

COMMENTS:

DATE 04-13-79

HOSP. NO. KG

NAME [REDACTED]

AGE 24

ADDRESS [REDACTED] 23

CHARGE Q611

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 USE IMPRINTED STAMP PLATE ONLY 7514 2508 R 11-77

CHART COPY

48 : 61600

PG

DR: NP
009:

SEX : M NS: PED
ROOM: RES

NAME: KEVIN GARRETT
23

***** U R I N A L Y S I S *****

SG	PH	APPR	T-PROT	GLUC	KEIO	BILE	BLD	URG
\ APR 13 1.026 \ 1600R	=7	YELO CLR	NEG	NEG	NEG	NEG	NEG	NEG
WBC	RBC	BACT	CAST	CAST	REMARK	REMARK		
\ APR 13 0 \ 1600H	0	NONE	NONE	NONE	NONE	NONE		

***** H E M A T O L O G Y *****

[illegible]

NEG NEGATIVE
KEVIN GARRETT

UNIVERSITY OF IOWA HOSPITALS AND CLINICS
END OF REPORT

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PG. 1