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Vitamin B in Lamb Tissues and Organs

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Introduction

For some years before vitamin B was shown to be separable into at least two components, its multiple nature was foreshadowed. In 1912, Cooper(1) summarizing his work showed that the relative efficiencies of the various foodstuffs in preventing polyneuritis and maintaining the body weight of birds fed on polished rice did not correspond. This indicated that the antineuritic factor and the substance maintaining body weight are not identical. Chick and Hume in 1917-1919(2) showed that some materials potent in the prevention or cure of polyneuritis were incapable of maintaining the weight of birds on a diet of polished rice. Smith(3) in 1926 found that he could not induce growth in rats when 1 or 2 mgms. of Seidell's vitamin B picrate were given as the sole source of vitamin B in an otherwise adequate diet. When autoclaved yeast was added to the diet good growth resulted though loss of weight and death resulted when autoclaved yeast was given without the picrate. Since the antineuritic vitamin is known to be destroyed by temperatures over 100 degrees C, it followed that the growth-stimulating factor in autoclaved yeast could not be that vitamin.

Other workers, Goldberger and Lillie(4), Hauge and Carrick (5) in 1926, and Chick and Roscoe in 1927 (6) have shown that there are at least two components in the vitamin B complex. One of these is the antineuritic factor; the other is the antipellagic. Vitamin B₁ is used to designate the antineuritic factor and the majority of workers use the term vitamin B₂ to designate the antipellagic fraction of the vitamin B complex.

Differences in stability to heat and distribution in foods have made it possible to identify vitamins B₁ and B₂ of the vitamin B complex.

The potency of foods in vitamin B₂ (G) is usually based upon rate of growth in unit time. Although some workers have found a lack of correlation between the failure of growth and the incidence of pellagra, rate of growth has continued to be used as the measure of the amount of vitamin B₂ (G) in food tested.

Experimental work in the last two years has indicated the presence of another factor in the vitamin B complex that has been found to be the flavins.

Experimental work in this laboratory on the vitamin B complex was begun before experiments elsewhere were reported indicating the presence of flavins in the complex. The Bourquin method was used to test for the vitamin B₂ (G) factor of the lamb tissues and organs and results of the experiments are reported as vitamin B₂ (G) values, with recognition of the fact that the growth measured in the experiments may be flavin values rather than vitamin B₂ (G). According to Bisbey and Sherman 1935 (21) the measurement of vitamin B₂ (G) as made by the Bourquin method is essentially flavin values.

Much of the early work on the distribution of vitamin B in foodstuffs is now known to pertain to the antineuritic factor only. The examination of raw tissues and organs of beef, pork and lamb for vitamin B has been meagre. Cooper(1) 1912 found that less ox heart, ox liver and sheep's brain than ox muscle was required to protect pigeons from polyneuritis. Chick and Hume(7) in 1917 working with pigeons and using a number of foods showed the approximate relative values of these foods weight for weight in the natural condition. With the value of wheat germ taken as equal to 100, ox liver was given a value of 50 and ox muscle 11. Plimmer 1933(8) used animal tissues cooked with flour, to test for vitamin B₁ and Hoagland 1929(9) dried the fresh beef and pork tissues that he used for feeding tests with young rats. Until Hoagland's(9) work with pork it was assumed that because beef muscle was

low in vitamin B₁ that pork and lamb were no richer. Since pork was found richer in vitamin B₁ there was a possibility that the vitamin content of lamb might also vary from that of beef.

When tested for vitamin B₂ (G) Goldberger and Wheeler (10) in 1928 found lean beef a preventive for both pellagra and black tongue. Aykroyd and Roscoe 1929 (11) put dried ox liver at the head of their list of vitamin B containing foods. Hoagland (12) 1930 found approximately the same quantities of vitamin B₂ (G) in beef, lamb and pork muscle, with beef liver and pork liver five to eight times richer than the muscle. Carlsson 1929 (13) obtained the vitamin B₂ (G) value of muscle, liver, kidney, heart muscle, brain tissue and blood of rats, and compared the effects of a vitamin rich and vitamin poor diet on the tissues of rats when used to feed white rats for vitamin B₂ (G). She found muscle from rats on a vitamin B₂ (G) rich diet was twice as rich as muscle from rats fed a vitamin B₂ (G) deficient diet.

Elvehjem's 1935 (14) report on the vitamin B (B₁) content of animal tissues showed first, the distribution of vitamin B₁ in some tissues and organs of pork and beef; second, that of pork, beef and mutton muscle the least amount of pork was required to prevent polyneuritis in chicks.

Elvehjem found that muscle was richer in vitamin B₁ than any other tissue or organ of pork. In beef the richest source of vitamin B₁ was the kidney.

Experimental

For the measurement of vitamins B₁ and B₂ (G) the methods as developed by Sherman and Spohn 1923 (15), Chase 1928 (16) and Bourquin 1929 (17) were followed with modifications as indicated in the following experiments. Basal diets fed were adequate in all respects save for the vitamin being tested. The animals on vitamin B₁ and B₂ (G) free diets were allowed to deplete on the diet until the weight remained constant at which time they were ready for the experimental period of

eight weeks. Supplements were fed daily for five days and doubled on the sixth day. Animals were weighed every five days and weights recorded.

Preparation of the Lamb Muscle and Organs Used as the Source of the Vitamins B₁ and B₂

The lambs(18) used in this experiment as the source of vitamins B₁ and B₂ (G) were raised on the College Farm from the regular breeding flocks. The mothers of these lambs during pregnancy period had been fed a good ration, consisting of oats, alfalfa hay and prairie hay. They were born in April and May, nursed during the summer months while following their mothers on a low land pasture of blue grass and brome grass. A few weeks after birth the lambs were allowed access to oats in a creep until the pasturage became good. About Oct. 1 the lambs were weaned and placed in a feed lot on a ration of shell corn and alfalfa hay. In January, after having been on feed for a period of two to three months, the animals were slaughtered at intervals of seven to ten days. In all cases they were well finished by the time of slaughter and the carcasses were graded as choice.

Organs were removed at the time of slaughter and placed in the cooler along with the carcass and allowed to chill for 24 hours at approximately 34 degrees F. Then a two-pound portion of the lean from the leg muscle was removed from the carcass. Visible fat was removed from the lean meat, tissues and organs, and each was ground finely. Each sample was halved, one portion placed in the refrigerator at 5 degrees C, and the other portion autoclaved at 15 pounds pressure for one hour. The portion of fresh tissues and organs was fed as the source of vitamin B₁ and the autoclaved portions as the source of vitamin B₂ (G). This latter was fed some months later. The testing for each vitamin was made with samples from the same lambs.

Experiments With Vitamin B₁

The basal diet used in these experiments in testing for vitamin B₁ was that developed by Sherman and Spohn 1923 (15) and Sherman and Chase 1928 (16). A slight change in adding the autoclaved yeast was made. This was fed at 500 mgms. per day rather than as 15 per cent of the diet. The composition of the diet was as follows:

Diet 107. (15)	Per Cent
Casein, extracted with 20 per cent a.c. (19)	18
Salt mixture, Osborne and Mendel (23)	4
Butter fat	8
Cod liver oil	2
Cornstarch	68
500 mgms. autoclaved yeast given daily to each animal to supply vitamin B ₂ (G).	

Animals at 28 days of age and from 50 to 60 grams in weight taken from mothers on Diet 13 (20) and placed on the above diet decline in weight in 20 to 25 days. One animal in every litter was allowed to remain on the basal diet as a negative control. The others were placed on varying quantities of the supplements so that there were at least 10 animals on each amount. Five or half of the number were male rats.

Thirty to 60 animals were started on the same day and the beginning date of the last group was not more than three months later than the beginning date of the first group put on experiment.

Experimental Results With the Vitamin B₁ Deficient Diet

The records of individual animals on Diet 107(15) with autoclaved yeast added, the negative controls are shown in Table 1. The data are for three years inclusive. The mean gain of 54 animals as negative controls was 5.53 grams in the eight weeks experimental period.

Individual records of animals on the basal diet with varying amounts of the samples of lean meat, liver, kidney, heart, tongue, brain, pancreas and thymus are shown in Tables 2 to 9. The mean gains and losses of the animals on varying amounts of the different tissues and organs and the controls follow.

Gains Made on Varying Amounts of the Different Supplements When Fed as the Source of Vitamin B₁

Supplement	Amt. Fed Daily Grams	Mean of Gains Made Every Five Days—Grams											Total Gain Gms.
Meat	0.5	3.4	2.6	6.4	7.8	4.4	7.2	2.0	5.6	-1.4	13.4	-1.8	49.6
	1.0	7.8	7.8	9.0	8.7	9.6	6.9	6.5	2.9	-0.4	4.1	0.4	63.3
	2.0	13.6	7.4	10.0	7.8	7.6	4.9	8.3	6.7	4.5	9.9	3.1	83.8
	7.0	20.0	13.0	19.8	17.3	11.0	10.6	10.6	5.3	3.8	9.6	4.3	125.3
Liver	0.3	0.8	1.4	0.5	2.5	-0.6	0.3	1.6	1.1	1.0	2.1	0.9	11.6
	0.5	6.3	8.2	4.9	5.8	3.7	7.3	6.3	3.7	2.9	4.8	3.1	57.0
	1.0	12.1	11.2	8.3	8.8	2.3	8.3	6.4	3.8	1.0	5.8	2.8	70.8
	2.0	16.9	6.4	16.0	14.4	14.3	14.8	13.0	6.5	11.9	8.1	8.8	131.1
Kidney	0.15	1.9	-1.5	1.1	0.8	-0.1	1.5	-0.3	2.9	1.7	2.0	0.2	10.2
	0.3	4.0	5.6	7.8	7.2	3.6	3.9	-0.1	0.6	3.6	6.8	0.8	43.8
	0.5	10.4	12.4	11.8	8.9	5.8	5.5	8.5	5.1	3.3	8.3	6.7	86.7
Heart	0.1	1.1	2.9	1.7	0.8	0.9	1.5	-0.8	-0.7	-0.7	1.1	-2.1	5.7
	0.3	5.5	5.7	3.1	4.9	4.4	3.5	4.1	2.4	-1.1	4.1	0.1	36.8
	0.5	11.7	11.2	9.7	9.1	8.5	6.7	5.9	9.6	3.7	6.7	7.1	89.9
	1.0	16.3	13.5	19.0	14.0	14.0	5.5	11.5	5.0	7.8	0.3	7.0	113.9
Tongue	0.25	-2.0	-9.0	-1.0	-5.7	-4.4	-5.0	*					-27.1
	0.5	1.7	0.4	2.6	2.0	-1.8	0.8	-0.8	2.7	1.3	4.0	1.6	14.5
	1.0	4.6	2.3	5.8	5.3	2.1	3.5	0.6	0.5	1.5	0.2	1.8	28.2
	1.5	11.1	7.5	10.1	2.9	9.8	4.8	5.8	6.5	7.3	3.3	7.4	77.6
	2.0	18.0	6.0	15.5	20.0	8.5	-1.5	17.5	4.5	2.5	12.5	8.0	111.5
Brain	0.5	3.6	1.2	4.0	3.5	4.4	1.8	2.4	6.0	-0.1	5.3	1.1	33.2
	0.75	3.4	6.0	5.0	7.2	4.6	0.6	3.4	6.0	0.4	6.5	3.5	46.6
	1.0	9.1	7.1	9.9	7.0	8.3	6.9	11.3	6.0	2.1	8.0	0.6	76.3
	2.0	15.8	8.3	18.8	10.8	7.0	7.0	11.3	5.0	-4.3	6.8	2.3	88.8
Pancreas	0.05	1.0	5.0	2.5	-6.8	-9.0	-6.5	-14.3	-5.3	*			-33.4
	0.25	0.5	-0.4	1.5	5.3	-0.3	2.5	1.4	3.3	0.3	1.6	3.4	19.1
	0.50	4.9	5.7	4.1	6.5	1.7	2.8	2.1	1.7	1.8	3.4	1.9	36.6
Thymus	0.05	0.3	0.8	-4.0	-11.3	-12.5	-4.0	-2.3	-1.0	-0.8	1.0	2.5	-31.3
	0.1	2.5	4.5	-2.5	-3.5	-5.0	-11.5	*					-26.0
	0.25	3.3	1.0	-2.3	1.5	-4.0	2.6	0.1	1.6	0.8	1.0	1.0	6.6
	0.5	1.8	1.3	0.4	-0.6	-2.1	2.0	0.3	1.3	0.8	1.9	1.5	8.6
Controls		2.1	-1.1	-0.1	-0.2	-0.7	0.6	1.1	0.8	0.8	1.6	0.6	5.5

* All animals died before end of experimental period.

VITAMIN B IN LAMB TISSUES AND ORGANS

Distribution of Vitamin B₁ in Fresh Lamb Muscle, Liver, Kidney, Heart, Tongue, Brain, Pancreas, and Thymus

Relative amounts of vitamin B₁ in fresh lamb muscle and organs were estimated by feeding tests with 28-day old rats. The rats were fed a diet deficient in vitamin B₁ but otherwise adequate until they ceased to gain in weight. They were then fed varying amounts of the supplements until the proportion was obtained which would give a gain of about 3 grams a week or 25 grams in the eight-week experimental period. Supplements were fed daily to the individual animals for five days and were doubled the sixth day, thereby making a total of the equivalent of seven feedings a week.

A summary of the lamb tissues and organs tested with amounts of each follows:

Meat	7, 2, 1 and 0.5 grams
Liver	2, 1, 0.5 and 0.3 grams
Kidney	1, 0.5, 0.3 and 0.15 grams
Heart	1, 0.5, 0.3 and 0.1 grams
Tongue	2, 1.5, 1.0, 0.5 and 0.25 grams
Brain	3, 2, 1, 0.75 and 0.5 grams
Pancreas	1, 0.5, 0.25 and 0.05 grams
Thymus	0.5, 0.25, 0.1 and 0.05 grams

Discussion of Results

Following is a list of supplements with the approximate amount of each which gave a gain of 25 grams or better in the eight weeks on experiment when fed as the source of vitamin B₁. Estimated number of Sherman units per gram for each organ or tissue is listed.

Tissue or Organ	Amt. fed daily, gms.	Gain in 8 weeks, gms.	Sherman units per gm.
Meat	0.5	49.6	2+
Liver	0.5	57.0	2+
Kidney	0.3	43.8	3+
Heart	0.3	36.8	3
Tongue	1.0	28.2	1-
Brain	0.5	33.2	2
Pancreas	0.5	36.6	2
Thymus		—	—

Vitamin B₁ appears to be fairly evenly distributed in the muscle and organs of lamb with kidney and heart the richest source and 3 times richer than tongue.

Experiments With Vitamin B₂ (G)

Experiments similar to the foregoing were run with the same materials in testing for the vitamin B₂ (G) content. The samples were canned at 15 pounds pressure for one hour, then stored until needed. The basal diet used was developed by Sherman and Spohn 1923 (15) and Bourquin 1929 (17). An alcoholic extract of whole wheat was used as the source of vitamin B₁. This diet has the following composition:

Diet 555. (17)	Per Cent
Casein (alcohol extracted) (19)	18
Salt mixture, Osborne and Mendel (23)	4
Butter fat (filtered)	8
Cod liver oil	2
Cornstarch (approximately)	44
Cornstarch, carrying wheat extract (approximately)	24

The wheat extract was prepared according to Bourquin 1929 (17). The diet was free from the thermostable factor vitamin B₂ (G). Animals given the diet alone and used as negative controls usually live through the experimental period with only a small loss in body weight. Animals maintained on this diet until weight is constant and then fed varying amounts of a supplement for an experimental period of eight weeks usually show graded responses in growth. Carlsson 1929 (13) in reporting her experiments gives data that were used in estimating the amounts of vitamin B₂ (G) to be fed.

Experimental Results

Individual records of the animals on Diet 555 (17) only are given in Table 10. Tables 11-18 show the variation in growth gains and losses of rats receiving the basal diet with varying amounts of the supplements meat, liver, kidney, heart, tongue, brain, pancreas and thymus added as the source of vitamin B₂ (G). The supplements fed daily and amounts of each are listed below:

Meat	1.50, 1.00, 0.75 and 0.50 grams
Liver	0.15, 0.10 and 0.05 grams
Kidney	0.25, 0.15 and 0.10 grams
Heart	0.50, 0.30 and 0.10 grams
Tongue	0.50, 0.30 and 0.10 grams
Brain	0.60, 0.40 and 0.20 grams
Pancreas	0.50, 0.30 and 0.10 grams
Thymus	0.30, 0.20 and 0.10 grams

Mean gains and losses of animals on varying amounts of the different supplements follow:

Gains Made on Varying Amounts of the Different Supplements When Fed as the Source of Vitamin B₂(G)

Supplements	Amt. Fed Daily Grams	Mean of Gains Made Every Five Days—Grams											Total Gain Gms.
Meat	0.50	-0.8	1.4	0.5	2.7	3.1	2.6	2.5	3.1	-2.2	0.1	-2.6	10.4
	0.75	3.7	2.9	3.6	4.0	4.9	5.9	5.5	8.0	1.1	2.5	5.2	47.3
	1.00	2.7	5.3	3.5	7.5	9.0	4.3	6.0	11.1	2.1	1.2	4.8	57.5
	1.50	1.0	9.1	3.8	7.5	6.6	14.4	9.3	12.0	3.7	2.2	6.2	75.8
Liver	0.05	-1.5	-2.2	-2.5	-6.9	-1.4	-2.3	0.4	0.3	0.2	-2.3	-0.3	-18.5
	0.10	0.7	1.6	1.1	0.9	-0.6	-3.1	-0.9	1.2	2.4	-1.4	1.2	3.1
	0.15	2.6	0.6	2.9	3.0	3.0	-1.1	2.9	4.2	2.1	4.8	2.0	27.0
Kidney	0.10	-1.4	1.8	-4.0	0.5	0.6	-2.6	-1.7	6.2	2.3	6.7	7.0	19.0
	0.15	1.1	4.1	3.0	3.5	1.5	-0.1	3.8	2.6	3.9	4.6	5.4	33.4
	0.25	2.5	6.5	8.5	7.0	1.4	2.6	8.0	2.9	-2.2	6.0	1.2	44.4
Heart	0.10	-0.8	-0.9	1.0	5.1	5.8	4.0	6.3	-0.7	5.7	4.4	3.5	33.3
	0.30	2.4	0.5	3.6	5.6	11.3	9.5	10.9	1.5	8.4	7.1	5.9	66.7
	0.50	4.4	3.7	2.7	13.0	14.4	10.4	15.9	2.1	8.7	7.5	8.0	90.8
Tongue	0.10	-0.2	-0.6	-1.5	-4.3	-1.1	-0.3	1.1	2.3	-2.9	0.7	1.7	-5.1
	0.30	0.9	-0.3	-0.7	-1.5	3.7	1.0	3.7	2.5	1.0	1.9	3.3	15.5
	0.50	0.7	1.6	2.0	-1.0	2.3	1.5	5.9	3.0	1.0	5.1	4.4	24.7
Brain	0.20	2.0	-3.3	-1.0	-7.5	-3.3	-3.1	0.3	0.9	0.5	0.6	*	-13.9
	0.40	-0.7	0.5	2.7	2.0	0.4	0.7	4.3	3.7	-0.4	4.7	*	18.1
	0.60	3.2	4.0	6.2	2.0	4.4	3.0	3.4	4.8	-1.1	5.3	*	35.2
Pancreas	0.10	-3.3	4.0	-1.0	0.3	3.8	5.5	-0.3	-1.8	3.0	0.5	1.0	11.7
	0.30	5.8	12.0	6.0	11.0	12.3	4.0	1.3	-0.8	6.5	6.5	4.3	68.9
	0.50	6.3	11.0	4.5	15.5	9.8	8.5	0.3	0.0	5.9	6.5	4.3	71.5
Thymus	0.10	6.3	5.3	6.8	4.8	7.0	4.5	2.5	-2.0	2.5	8.5	-3.3	42.9
	0.20	3.8	5.5	5.3	8.8	7.8	7.8	0.3	2.3	4.8	13.0	-0.8	58.6
	0.30	6.3	6.3	7.8	10.0	6.8	4.0	0.8	-1.0	5.0	13.8	3.0	62.8
Controls		1.2	2.3	1.4	1.0	0.4	-0.8	0.5	0.6	-0.7	-0.4	-1.2	4.3

VITAMIN B IN LAMB TISSUES AND ORGANS

Amount of each supplement which when fed as the source of vitamin B₂ (G) gives approximately 25 grams gain is listed as follows with an estimated number of Sherman units per gram for each organ or tissue listed.

Tissue or Organ	Amt. fed daily, grams	Gain in 8 weeks, grams	Sherman units per gm.
Meat	0.75	47.3	1.3
Liver	0.15	27.0	6.6
Kidney	0.15	33.4	6.6
Heart	0.10	33.3	10.0
Tongue	0.50	24.7	2.0
Brain	0.60	35.2	1.6
Pancreas	0.30	68.9	3.3
Thymus	0.10	42.9	10.0

If growth is a measure of vitamin B₂ (G) then thymus is the richest source of vitamin B₂ (G) and meat is the poorest source of that vitamin. All amounts of thymus fed showed gains, and the lowest dose fed, 0.1 gram, gave a mean gain of nearly 45 grams in the eight weeks. Lamb thymus is about six to seven times richer in vitamin B₂ (G) than meat.

A comparison of the vitamin B₁ and B₂ (G) values of lamb tissues and organs shows that thymus has about 10 units per gram of vitamin B₂ (G), but a negligible amount of vitamin B₁. Kidney and heart are slightly richer sources of vitamin B₁ than the other tissues and organs, and thymus and heart are richer than the other organs in vitamin B₂ (G). Kidney and liver are next richest in vitamin B₂ (G). The vitamins B₁ and B₂ (G) in brain are about evenly distributed while tongue has twice as much vitamin B₂ (G) as B₁.

The following table shows the relative amounts of vitamin B₁ and B₂ (G) in the different supplements when fed as the source of the B vitamins:

Gains Made on Varying Amounts of the Different Supplements When Fed as the Source of the B Vitamins (a)

Supplements	Vitamin B ₁		Vitamin B ₂ (G)	
	Amt. fed Daily Grams	Mean Gain in 8 weeks Grams	Amt. fed Daily Grams	Mean Gain in 8 weeks Grams
Meat	0.50	49.6	0.50	10.4
	1.00	63.3	0.75	47.3
	2.00	83.8	1.00	57.5
	7.00	125.3	1.50	75.8
Liver	0.30	11.6	0.05	-18.5
	0.50	57.0	0.10	3.1
	1.00	70.8	0.15	27.0
	2.00	131.1		
Kidney	0.15	10.2		
	0.30	43.8	0.10	19.0
	0.50	86.7	0.15	33.4
Heart			0.25	44.4
	0.10	5.7		
	0.30	36.8	0.10	33.3
Tongue	0.50	89.9	0.30	66.7
	1.00	113.9	0.50	90.8
	0.25	-27.1	0.10	-5.1
	0.50	14.5	0.30	15.5
Brain	1.00	28.2	0.50	24.7
	1.50	77.6		
	2.00	111.5		
	0.50	33.2	0.20	-13.9*
Pancreas	0.75	46.6	0.40	18.1*
	1.00	76.3	0.60	35.2*
	2.00	88.8		
	0.05	-33.4	0.10	11.7
Thymus	0.25	19.1	0.30	68.9
	0.50	36.6	0.50	71.5
	0.05	-31.3	0.10	42.9
Neg. Controls	0.10	-26.0	0.20	58.6
	0.25	6.6	0.30	62.8
	0.50	8.6		
		5.5	4.3	

(a) Previous figures from this laboratory were brought up to date.

* Animals on brain were killed at 50 days.

The relative richness of lamb tissues and organs in the two factors measured, vitamin B₁ and B₂ (G), is as follows:

In vitamin B₁ kidney is the richest, followed by heart, meat, liver, pancreas, brain, and tongue. Thymus has a negligible amount of vitamin B₁.

In vitamin B₂ (G), the growth factor thymus is first, then heart, kidney, liver, pancreas, tongue, brain, and meat.

Further work will need to be done to determine whether the vitamin B₂ (G) as measured by the growth method is the antipellagic factor, the flavin or the combination of both. It might be mentioned in this connection that other laboratories recently have found that growth response may reflect only the flavin fraction of the vitamin B complex.

Summary

The determinations of vitamins B₁ and B₂ (G) in the body was made by feeding lamb tissues and organs to young rats on a diet adequate save for the vitamin that was being tested.

Lambs fed adequate diets supplied the tissues and organs that were used for feeding.

Meat, liver, kidney, heart, tongue, brain, pancreas, and thymus from the same lambs were used in testing for vitamins B₁ and B₂ (G). Fresh tissues and organs were used for the vitamin B₁ tests and canned tissues and organs were used for the vitamin B₂ tests.

Vitamin B₁ is fairly evenly distributed in lamb tissues and organs varying from one to three Sherman units per gram.

Vitamin B₂ (G) varies considerably in lamb tissues and organs. On the basis of growth response thymus is the richest source, followed in order by heart, kidney, liver, pancreas, tongue, brain, and meat. Thymus and heart are about eight times richer than meat as a source of vitamin B₂ (G).

In general lamb tissues and organs contain more units per gram of vitamin B₂ (G) than of vitamin B₁.

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Vitamin B₁ in Lamb Tissues and Organs

(Tables 1 to 9, inclusive)

TABLE 1

Change In Weight On Basal Diet Only (Diet 513)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
Controls		M	355	98	1	3	-2	-2	-23	-16	*					59	-39	Emaciated, Polyneuritic
		M	367	100	3	5	-1	2	0	2	-6	-5	-8	-8	-12	72	-28	Emaciated, Polyneuritic
		M	380	98	9	3	1	-5	-13	0	0	-27	-5	*	61	-37	Emaciated, Polyneuritic	
		M	431	89	6	-4	-15	-20	*						56	-33	Emaciated, Polyneuritic	
		M	441	61	-1	-1	6	9	16	2	16	2	2	7	6	125	64	
		M	447	87	-2	-5	1	-2	5	9	10	-2	7	-3	1	106	19	
		M	462	84	12	4	0	2	1	5	5	14	1	4	-2	130	46	
		M	495	92	7	0	1	1	14	11	10	-9	7	6	1	141	49	Polyneuritic
		M	501	58	-2	3	5	2	5	5	-2	-1	8	4	7	92	34	
		M	510	78	3	9	7	10	13	-1	10	4	6	3	2	144	66	
		M	545	98	1	11	9	8	0	11	6	0	-4	-3	-3	134	36	
		M	572	55	1	-7	-4	-5	-8	*						32	-23	Emaciated
		M	573	54	-2	-5	-7	0	*							40	-14	Emaciated
		M	582	73	5	1	-3	-4	-7	-10	-9	*				46	-27	Emaciated, Polyneuritic
		M	583	73	-2	-8	0	-6	-1	-10	*					46	-27	Emaciated
		M	584	66	8	6	2	-15	-8	-9	*					50	-16	Emaciated, Polyneuritic
		M	1051	66	6	-3	3	4	1	4	-2	3	2	12	-1	95	29	
		M	1086	53	6	6	7	6	8	4	0	8	0	12	3	113	60	
		M	1078	66	-1	-6	3	1	3	-1	0	6	1	15	-1	86	20	
		M	1098	57	7	3	5	3	4	4	1	8	2	12	4	110	53	
		M	1109	53	2	-2	-1	-4	2	2	2	8	2	0	6	70	17	Polyneuritic
		M	1116	65	4	4	7	14	4	7	9	6	6	13	2	141	76	
		M	1124	111	3	2	5	0	-9	-5	-9	-3	0	6	2	103	-8	
		M	1136	97	-1	-4	4	9	-4	4	7	1	4	6	1	124	27	
		M	1141	110	5	3	-1	10	5	4	2	0	3	3	4	148	38	
		M	1146	77	5	-2	-5	14	2	10	-2	9	7	12	6	133	56	
		M	2193	88	-6	-14	*									68	-20	Emaciated
		M	2205	72	-8	-14	*									50	-22	Emaciated, Polyneuritic
		M	2215	75	-3	-5	-18	*								49	-26	Emaciated, Polyneuritic
		M	2218	73	-9	-10	*									54	-19	Emaciated
		M	2228	64	-14	-7	*									43	-21	Emaciated, Polyneuritic
		M	2236	68	2	1	-1	6	2	-4	1	-4	-1	-10	-4	56	-12	Emaciated

F indicates female, M male.

(Continued on Next Page.)

TABLE 1 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
		M 2243	74	-3	-14	-2	*									55	-19	Emaciated, Polyneuritic
		M 2252	60	-1	-9	-7	*									43	-17	Emaciated, Polyneuritic
		M 2261	66	-1	-5	-9	*									51	-15	Emaciated
		M 2279	78	-4	-4	-6	-15	*								49	-29	Emaciated, Polyneuritic
		M 2286	65	5	4	-3	-18	-2	*							51	-14	Emaciated
		F 345	105	5	1	-1	1	-3	3	-1	-3	-5	-4	2	100	-5	Emaciated, Polyneuritic	
		F 379	99	-2	0	0	-10	-9	-12	-9	-2	*			55	-44	Emaciated, Polyneuritic	
		F 417	78	12	2	8	-1	-1	1	13	1	-1	3	2	117	39		
		F 426	84	6	0	2	-7	7	2	0	10	5	-2	11	118	34		
		F 461	58	11	7	11	8	5	11	4	-1	3	3	2	122	64		
		F 481	52	8	12	12	9	2	5	-1	3	4	2	10	118	66		
		F 522	107	13	8	5	5	-1	9	5	4	-2	-7	-5	141	34		
		F 531	83	8	11	1	4	0	4	6	2	-3	-8	-1	107	24		
		F 543	73	3	9	6	0	-2	9	8	8	-3	-1	-9	101	28		
		F 575	61	5	-14	-3	-2	-11	-3	*					33	-28	Emaciated	
		F 576	57	4	-7	-4	2	-3	-11	-6	*				32	-25	Emaciated, Polyneuritic	
		F 577	56	-1	-4	-1	-3	0	-4	-10	*				33	-23	Emaciated	
		F 578	50	6	-6	-4	-4	-8	-2	*					32	-18	Emaciated	
		F 579	65	-2	-8	-7	-10	*							38	-27	Emaciated	
		F 580	57	-4	-3	-8	-5	-2	*						35	-22	Emaciated	
		F 586	63	2	-4	-2	-3	-9	-7	*					40	-23	Emaciated	
		F 587	58	1	-6	-6	-4	-11	-1	*					31	-27	Emaciated	
		F 1162	79	1	0	4	6	-3	1	4	2	4	10	-1	107	28		

* Died during experimental period.

F indicates female; M male.

TABLE 2

Change in Weight On Varying Quantities Of Meat

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				6	2	11	11	1	13	1	7	-1	17	-5				
Meat	0.5	M 1062	75	6	2	11	11	1	13	1	7	-1	17	-5	138	63		
		M 1084	70	4	1	6	4	14	5	4	11	-3	14	0	130	60		
		F 1056	59	3	-2	0	1	1	2	0	2	4	14	2	86	27		
		F 1064	76	6	9	9	9	5	8	-1	2	-7	11	-4	123	47		
	F 1152	70	-2	3	6	14	1	8	6	6	0	11	-2	121	51			
	1.0	M 436	89	-4	9	15	9	22	7	18	0	-3	4	-3	163	74		
		M 437	82	6	-1	12	6	20	5	14	1	-2	-1	5	147	65		
		M 453	65	21	14	20	15	5	22	8	3	-2	1	5	177	112		
		M 454	77	7	15	20	12	13	20	8	11	-8	0	-1	174	97		
		M 1050	67	7	3	1	0	4	11	4	2	10	11	-6	114	47		
		M 1060	78	9	8	11	18	5	3	4	4	-1	15	-5	149	71		
		F 443	81	9	10	9	9	22	-1	7	-3	2	-2	8	151	70		
		F 444	84	16	2	8	10	9	-4	6	0	-4	2	8	137	53		
		F 448	95	9	7	6	2	13	3	6	6	-3	8	-10	142	47		
		F 449	82	0	-2	2	5	8	13	4	1	-2	0	-3	108	26		
		F 548	98	10	19	1	5	12	5	1	4	2	-1	-3	153	55		
		F 549	94	6	10	7	8	1	12	9	2	-2	1	1	149	55		
		F 1054	59	7	4	3	3	6	3	7	7	2	6	0	107	48		
		F 1055	61	7	-3	5	5	5	7	0	5	4	10	2	108	47		
		F 1153	77	6	15	9	22	3	2	4	0	-1	6	6	149	72		
		F 1154	77	9	14	15	10	6	2	4	3	1	5	3	149	72		
		2.0	M 405	80	25	15	15	7	12	-2	22	0	5	13	-2	190	110	
			M 406	82	22	20	13	9	7	5	21	0	8	14	12	213	131	
	M 464		86	22	6	16	7	10	2	6	15	-3	13	3	183	97		
	M 466		75	23	2	12	16	0	1	6	17	-5	10	-12	145	70		
	M 1048		60	6	2	8	9	13	8	4	10	6	8	2	136	76		
	M 1049		65	11	2	5	17	14	5	1	4	5	10	0	139	74		
	M 1159		72	3	12	11	3	1	11	10	17	10	12	6	168	96		
	F 411		73	19	16	12	17	3	7	4	1	7	11	12	182	109		
	F 412		69	16	8	2	-15	10	2	29	4	4	15	8	152	83		
	F 468		75	20	0	14	15	6	5	7	7	4	5	-5	153	78		
	F 497		79	14	11	13	12	7	4	1	-10	12	6	8	157	78		
	F 1052		65	9	0	7	5	14	8	2	7	2	11	1	131	66		
	F 1053		55	9	-2	4	7	10	7	2	10	4	10	-7	109	54		
	F 1160		74	2	9	12	2	0	3	7	9	5	5	8	136	62		
	F 1161		72	3	10	6	6	7	7	2	9	4	6	12	144	72		
7.0	M 339		108	31	11	25	30	4	17	19	3	8	18	6	280	172		
	M 363		102	14	9	25	23	25	17	5	14	6	9	6	255	153		
	F 347		101	17	18	9	12	13	4	13	0	1	10	-3	195	94		
	F 368	82	18	14	20	4	2	4	5	4	0	1	8	162	80			

F indicates female; M male.

TABLE 3

Change In Weight On Varying Quantities Of Lamb Liver																	
Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams									Final Weight Gms.	Net Gain or Loss Gms.	Remarks		
Liver	0.3	M 2245	72	1	-11	-13	-1	*						48	-24	Emaciated, Polyneuritic Emaciated	
		M 2246	65	-3	-9	*								53	-12		
		M 2237	64	9	2	3	2	1	2	-1	5	-1	0	5	91		27
		M 2214	68	2	6	1	2	-3	-2	2	0	2	-1	1	78		10
		M 2289	69	2	10	5	-6	-4	-8	6	5	6	3	5	93		24
		M 1132	97	-2	12	0	10	4	2	5	1	-2	1	-2	126		29
		M 1133	103	5	8	3	14	-3	9	5	-1	0	10	5	158		55
		F 1118	82	6	3	4	10	4	7	5	-1	0	4	-1	123		41
		F 1119	88	1	3	4	6	0	3	4	2	-1	11	3	124		36
		F 2234	57	-6	-11	*									40		-17
		F 2235	54	-10	0	-9	*								35		-19
		F 2247	55	-7	-4	*									44		-11
		F 2292	62	7	5	3	2	-1	0	3	4	6	2	1	94		32
	F 2293	62	6	6	6	-4	-6	-9	-6	0	4	-1	-5	53	-9		
	0.5	M 427	101	-1	15	-10	-2	24	19	10	1	16	15	10	198	97	Emaciated
		M 428	100	4	6	-3	2	1	18	8	-9	19	8	8	162	62	
		M 535	82	8	17	25	4	1	9	10	10	-11	2	2	159	77	
		M 536	55	8	10	7	10	1	4	12	5	2	5	4	123	68	
		M 546	77	15	16	14	13	-3	17	13	14	-4	2	4	178	101	
		M 1123	114	7	4	-2	10	5	7	4	7	0	12	6	174	60	
		M 1131	119	9	14	10	15	4	7	12	5	3	6	-8	196	77	
		M 2229	52	-5	-3	-8	*								36	-16	
		M 2244	84	10	2	6	-1	-10	-12	-11	-4	*			64	-20	
F 433		96	-5	10	-1	-1	1	8	5	-2	9	3	6	129	33		
F 434		92	5	5	3	8	7	24	9	2	17	-3	4	173	81		
F 529		85	18	15	6	1	4	6	4	3	-3	3	3	145	60		
F 530		74	18	10	12	4	4	6	4	-1	3	-4	6	136	62		
F 547		87	9	13	11	10	6	2	9	4	-5	2	0	148	61		
F 1117		92	-2	1	-4	4	0	2	8	9	6	12	4	132	40		
F 1122		69	5	1	5	14	13	12	13	13	0	13	2	160	91		
F 2232	43	5	3	8	6	4	2	2	5	4	4	4	90	47			
F 2233	59	6	8	9	8	4	0	2	5	-4	7	0	104	45			

F indicates female, M male.

(Continued on Next Page.)

TABLE 3 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				20	8	8	14	0	14	1	-6	-7	7	1	173			
Liver	1.0	M 340	113	20	8	8	14	0	14	1	-6	-7	7	1	173	60		
		M 364	95	4	3	-1	4	3	-4	1	3	2	0	-1	109	14		
		M 533	88	23	19	18	3	0	9	9	-1	-4	7	6	177	89		
		M 534	91	27	30	16	7	-7	12	21	5	-3	8	8	215	124		
		M 1114	100	5	17	11	15	10	16	13	17	11	10	7	232	132		
		M 1115	96	7	10	1	6	2	0	3	6	10	11	0	152	56		
		F 348	103	0	-1	0	11	10	8	2	-5	-3	2	-1	126	23		
		F 369	90	3	5	8	7	1	5	-4	-1	0	1	-1	114	24		
		F 527	85	26	17	12	11	-6	10	6	7	-3	4	7	176	91		
	F 528	87	21	14	11	5	-1	7	3	2	3	-2	2	152	65			
	F 1120	82	5	5	7	9	8	11	11	6	6	8	6	164	82			
	F 1121	93	4	7	8	14	7	11	11	13	1	13	0	182	89			
		2.0	M 439	84	22	5	21	23	13	22	21	16	11	5	265	181		
			M 440	82	18	-1	15	19	15	15	27	18	20	16	3	247	165	
			M 499	96	23	12	13	26	22	16	15	7	14	9	19	272	176	
			M 500	62	6	8	12	13	17	17	15	-1	14	17	7	187	125	
			F 445	75	17	7	22	3	14	10	6	2	13	-4	8	173	98	
			F 446	73	18	-3	13	12	17	18	10	-1	6	4	6	168	95	
F 503			91	20	13	18	8	9	13	5	8	4	4	13	206	115		
F 504			72	11	15	14	11	7	7	4	-2	8	8	9	164	92		

F indicates female; M male.

* Died during experimental period.

TABLE 4

Change In Weight On Varying Quantities Of Lamb Kidney																	
Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams											Final Weight Gms.	Net Gain or Loss Gms.	Remarks
Kidney	0.15	M 1085	74	3	6	4	10	6	2	-4	5	-2	13	3	120	46	
		M 1087	67	8	6	4	6	4	8	-1	11	14	-6	-3	118	51	
		M 2221	68	-5	-14	-7	*								42	-26	Emaciated, Polyneuritic
		M 2222	74	-1	-12	0	-13	-3	*						47	-27	Emaciated, Polyneuritic
		M 2223	59	-7	-8	-6	*								38	-21	Emaciated, Polyneuritic
		F 1073	66	12	8	10	7	9	4	2	1	0	9	-3	125	59	
	F 1074	60	10	7	5	1	1	2	2	10	4	4	-2	104	44		
	F 2226	54	2	-4	-7	*								45	-9	Emaciated, Polyneuritic	
	F 2227	44	-3	-2	8	-2	-9	*						36	-8	Emaciated, Polyneuritic	
	F 2231	73	-2	-2	0	-1	-9	-1	-2	2	1	0	7	66	-7	Emaciated	
	0.3	M 455	86	16	8	9	13	6	16	2	0	1	3	-2	158	72	
		M 456	81	7	8	7	6	6	14	8	-1	3	6	4	149	68	
		M 496	86	-4	2	6	8	9	5	3	-9	14	14	1	135	49	
		M 507	91	3	13	1	10	16	-3	3	-7	5	9	-5	136	45	
		M 1067	79	4	11	13	14	7	-3	-4	1	-3	8	2	129	50	
		M 1068	67	7	8	12	14	5	0	0	7	1	16	3	140	73	
		M 1071	73	12	14	11	17	-4	3	5	12	11	16	3	173	100	
		M 2219	72	5	-1	0	3	0	-4	-16	*				59	-13	Emaciated
		M 2220	63	-5	-7	10	-16	*							45	-18	Emaciated
		F 450	89	6	8	4	5	1	1	1	-1	0	3	-4	113	24	
		F 451	79	5	-2	3	4	-3	10	4	0	1	2	-3	100	21	
F 505		64	5	7	11	9	7	7	4	-5	11	9	7	136	72		
F 506		61	6	8	13	7	11	9	3	-2	10	8	6	140	79		
F 1072		74	1	12	10	19	5	15	2	12	3	10	-3	160	86		
F 2224		64	-3	-5	7	1	-4	-1	-2	2	0	4	4	67	3	Emaciated, Polyneuritic	
F 2225	56	-1	6	7	1	-4	-6	-15	*				44	-12	Emaciated, Polyneuritic		
0.5	M 407	84	11	14	10	12	10	4	14	1	5	14	3	182	98		
	M 408	72	6	3	8	0	10	4	26	7	4	15	10	165	93		
	M 472	73	15	11	12	7	1	-2	1	2	1	-1	13	133	60		
	M 473	80	13	17	25	5	10	10	-1	5	1	-1	18	182	102		
	M 1065	82	2	17	8	7	3	1	2	7	5	14	2	150	68		
	M 1066	90	15	22	15	21	3	6	6	11	-2	9	-4	192	102		
	F 1058	63	12	9	11	13	3	12	4	7	3	15	0	152	89		
	F 1059	68	9	9	9	7	9	2	3	5	7	4	6	138	70		
	F 413	63	9	12	8	6	4	7	17	-1	7	12	6	150	87		
	F 414	73	15	12	12	9	2	6	15	9	-4	4	9	162	89		
	F 479	78	11	11	15	15	4	8	10	6	8	12	7	185	107		
	F 480	70	7	12	8	5	10	8	5	2	5	2	10	144	74		

* Died during experimental period.
F indicates female; M male.

TABLE 5

Change In Weight On Varying Quantities Of Lamb Heart																	
Dose	Amt. Per Day Gms.	Number of Rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams										Final Weight Gms.	Net Gain or Loss Gms.	Remarks	
Heart	0.1	M 342	119	1	-3	-5	-12	0	0	-8	-22	*		70	-49	Polyneuritic	
		M 366	90	4	-4	-3	1	-6	4	-3	-6	-7	-17	*	53	-37	Polyneuritic
		M 1095	71	8	7	7	4	11	1	-1	7	-4	6	-3	114	43	
		M 1096	70	2	11	5	11	6	8	-2	4	3	10	-4	124	54	
		M 2254	67	0	-3	5	7	7	-1	6	3	0	-3	2	90	23	
		M 2255	56	1	2	3	8	4	4	0	2	3	-1	-2	80	24	
		M 2282	63	1	1	0	-6	3	1	2	1	7	4	-2	75	12	Emaciated, Polyneuritic
		M 2283	67	0	0	4	4	-1	3	-2	-1	3	-1	-3	73	6	Emaciated, Polyneuritic
		F 346	102	1	8	-2	0	-9	2	-2	-7	2	3	-9	89	-13	Emaciated
		F 360	100	2	5	-2	4	2	8	-1	-3	-10	2	-10	97	-3	Emaciated
		F 1101	67	4	8	6	8	3	6	0	4	-6	6	-5	101	34	
		F 1102	62	3	10	8	6	6	6	-2	7	-2	8	2	114	52	
		F 2250	52			-10	*								42	-10	
		F 2251	29			-4	*								25	-4	Emaciated
	F 2284	70	4	-1	0	-12	-6	-9	*					46	-24	Emaciated, Polyneuritic	
	F 2285	56	0	6	1	-10	-5	-9	*					39	-17	Emaciated, Polyneuritic	
	0.3	M 370	122	14	5	-7	-2	6	-7	1	-7	-22	-10	-8	85	-37	Emaciated
		M 371	114	8	-3	-7	-7	-2	-1	-	-14	-9	-11	*	65	-49	Emaciated, Polyneuritic
		M 537	81	7	20	4	11	12	10	16	14	3	4	4	186	105	
		M 538	48	7	10	5	6	6	3	19	6	2	0	1	113	65	
		M 1093	61	6	0	3	5	1	7	2	8	6	15	5	119	58	
		M 1094	64	8	6	7	13	3	8	2	9	4	21	8	153	89	
		M 2238	50	6	12	12	10	3	-3	2	1	2	1	0	96	46	
		M 2253	62	6	-1	7	5	9	1	4	4	2	3	4	106	44	
		F 550	89	8	8	-5	2	1	11	10	-3	-5	1	-8	109	20	
		F 551	84	13	9	8	9	15	12	8	0	3	1	-4	158	74	
		F 361	95	4	8	2	5	-3	2	2	0	-5	0	0	110	15	Emaciated
		F 362	105	-2	7	-5	-1	3	4	0	-4	-4	2	-5	100	-5	Emaciated
F 1099		60	3	5	5	8	7	6	2	7	0	11	4	118	58		
F 1100		60	6	5	5	7	9	6	4	13	1	11	2	129	69		
F 2248	63	-3	-3	12	2	4	-2	-3	2	5	6	0	83	20	Polyneuritic		
F 2249	67	-3	3	4	6	-3	0	-1	2	0	10	-2	83	16			

F indicates female, M male.

(Continued on Next Page.)

TABLE 5 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				16	1	12	7	14	9	3	11	12	2	14				
0.5	M	420	95	16	1	12	7	14	9	3	11	12	2	14	196	101		
	M	432	94	0	18	6	6	12	22	2	1	12	6	9	188	94		
	M	511	80	13	11	16	20	10	-1	1	0	5	10	4	169	89		
	M	539	45	11	10	9	-1	3	5	15	11	6	3	7	124	79		
	M	540	39	6	13	9	9	2	6	18	7	9	6	5	129	90		
	M	1088	68	5	9	6	13	6	5	3	23	-1	19	5	161	93		
	M	1092	68	16	7	10	15	14	6	8	17	0	14	8	183	115		
	F	421	86	14	2	2	0	17	13	9	20	6	2	15	186	100		
	F	422	85	15	4	11	2	13	15	1	12	3	2	7	170	85		
	F	478	74	21	18	18	19	7	8	-7	8	5	1	10	182	108		
	F	513	75	6	19	9	15	11	-3	3	-7	0	6	5	139	64		
	F	541	80	17	16	18	7	2	3	15	7	-4	4	4	169	89		
	F	542	78	12	22	4	12	2	6	11	7	-3	2	3	156	78		
	F	1089	68	13	9	6	6	6	3	2	13	1	10	6	143	75		
	F	1091	63	10	9	9	6	8	4	5	14	4	12	4	148	85		
	1.0	M	433	71	17	11	28	18	10	15	13	14	3	5	7	212	141	
M		475	86	22	19	8	22	25	3	7	10	15	-10	15	222	136		
F		442	92	12	4	22	12	16	2	14	-4	7	3	5	185	93		
F		452	88	14	20	18	4	5	2	12	0	6	3	1	173	85		

F indicates female; M male.

* Died during experimental period.

TABLE 6

Changes In Weight On Varying Quantities Of Lamb Tongue

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks	
Tongue	0.25	M 2201	74	-1	-23	0	-2	*							48	-26	Emaciated, Polyneuritic		
		M 2206	75	-4	-3	-6	-6	-6	-1	*							49	-26	Emaciated, Polyneuritic
		F 2198	94	-1	-1	3	-9	-7	-14	*							65	-29	Emaciated
	0.5	M 1106	59	7	10	10	4	-4	0	-3	5	0	9	6	103	44			
		M 1107	47	3	2	0	0	-3	4	2	7	4	6	8	80	33			
		M 2199	67	-8	-8	*							51	-16	Emaciated				
		M 2200	93	-1	-5	-6	-5	-16	0	*							60	-33	Emaciated, Polyneuritic
		M 2290	59	7	5	9	1	4	1	4	1	-2	-1	-3	85	26			
		F 1129	97	-3	-3	-1	5	0	5	-2	3	-1	9	6	115	18			
		F 1130	105	3	0	0	8	4	1	0	6	5	2	-8	126	21			
		F 2263	47	7	1	7	2	-3	-10	-6	-1	5	7	5	61	14	Emaciated		
		F 2264	33	0	2	4	3	2	6	-2	3	1	4	0	56	23			
			1.0	M 354	97	9	7	1	4	5	9	-10	-8	-8	-6	0	100	3	Emaciated
				M 376	93	2	6	0	-5	-6	-1	-9	-4	0	-18	*	58	-35	Emaciated, Polyneuritic
				M 1104	55	7	3	5	5	2	5	4	6	1	3	5	101	46	
M 1105	60			9	2	2	-1	-2	13	0	10	4	7	3	107	47			
M 2262	44			4	5	9	2	0	-8	1	7	7	6	6	83	39			
M 2196	94			5	2	7	14	2	2	1	1	-4	-5	-3	116	22			
F 359	111			-1	1	2	5	2	9	-5	-8	1	-8	2	111	0		Emaciated	
F 383	88			6	6	3	6	3	1	6	-6	3	7	-5	118	30			
F 1127	103			1	-1	4	10	7	7	11	6	4	8	2	162	59			
F 1128	103			0	2	10	10	8	4	1	2	5	7	8	160	57			
F 2259	61			6	0	4	8	1	3	6	2	1	0	2	94	33			
F 2260	63			7	-5	22	6	3	-1	1	-2	4	1	2	101	38			
	1.5			M 418	97	17	10	16	-6	20	6	9	4	12	3	10	198	101	
				M 419	96	19	1	14	6	18	9	7	11	18	5	6	210	114	
				M 1097	66	12	13	13	18	13	4	5	11	4	8	-1	166	100	
		M 1103	61	10	3	4	9	-1	8	0	4	1	2	14	115	54			
		F 423	87	15	6	6	-4	8	2	6	4	2	-1	8	139	52			
		F 424	93	13	6	12	-12	10	-4	11	11	8	-5	19	162	69			
		F 1125	97	4	12	11	10	8	10	2	3	5	9	-3	168	71			
		F 1126	100	-1	9	5	2	2	3	6	4	12	10	6	158	58			
			2.0	M 508	91	21	6	20	22	7	0	17	12	1	14	7	218	127	
M 509	78			15	6	11	18	10	-3	18	-3	4	11	9	174	96			

F indicates female ; M male.

* Died during experimental period.

TABLE 7

Change In Weight On Varying Quantities of Lamb Brain																		
Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
Brain	0.5	M 1075	64	20	3	8	3	20	7	4	7	-4	8	2	142	78	Emaciated Polyneuritic	
		M 1108	52	-2	-3	1	5	-1	6	1	4	8	7	8	86	34		
		M 2258	47	5	2	2	10	3	3	3	3	3	1	4	86	39		
		M 2209	88	-5	-5	2	0	-9	-4	-6	10	-3	0	0	68	-20		
		F 1079	63	4	5	5	0	12	6	8	10	-2	1	-8	104	41		
		F 1080	66	0	1	6	3	9	0	8	12	-3	25	-14	113	47		
		F 2241	56	0	0	3	1	-1	-3	2	3	1	0	13	75	19		
		F 2242	61	7	7	5	6	2	-1	-1	-1	-1	0	4	88	27		
	0.75	M 1076	73	-1	10	14	3	1	-5	3	8	-3	9	-1	111	38	Emaciated	
		M 1077	68	10	9	3	17	6	4	6	4	-1	15	-1	140	72		
		M 2256	65	1	2	4	7	7	0	7	3	2	-2	7	103	38		
		M 2257	54	2	3	6	5	5	4	-1	7	3	2	8	98	44		
		F 1081	64	4	1	6	9	15	8	4	14	0	15	0	140	76		
		F 1082	68	5	6	3	15	7	1	8	11	0	10	10	144	76		
		F 2239	45	3	17	1	-1	-2	-6	0	-1	0	3	0	59	14		
		F 2240	59	3	0	3	3	-2	-1	0	2	2	0	5	74	15		
	1.0	M 409	62	6	5	-1	-11	15	11	23	9	-2	11	6	134	72	Polyneuritic	
		M 410	67	18	9	22	4	8	12	8	3	2	0	-1	152	85		
		M 1134	118	2	7	13	10	6	5	3	1	1	8	-9	165	47		
		M 1135	117	8	10	9	19	6	7	8	8	4	8	-2	202	85		
F 415		67	13	10	13	6	17	-2	12	7	-5	9	1	148	81			
F 416		60	8	6	6	3	-1	8	20	2	1	10	5	128	68			
F 1083		56	18	5	11	15	10	6	4	13	6	12	6	162	106			
F 1137		96	0	5	6	10	5	8	12	5	10	6	-1	162	66			
2.0	M 470	77	19	7	19	8	10	9	5	17	-2	6	3	178	101			
	M 471	81	15	4	18	10	3	6	14	12	-10	-2	4	155	74			
	F 457	80	16	10	23	17	6	9	13	-2	2	4	2	180	100			
	F 458	77	13	12	15	8	9	4	13	-7	-7	19	0	156	79			

F indicates female; M male.

TABLE 8

Change In Weight On Varying Quantities Of Lamb Pancreas																	
Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams										Final Weight Gms.	Net Gain or Loss Gms.	Remarks	
Pancreas	0.05	M 353	104	1	9	3	-4	-5	-8	-28	*		72	-32	Emaciated, Polyneuritic		
		M 375	99	2	6	3	-9	-13	-1	-14	-7	*	66	-33			
		F 358	99	1	4	0	-10	-14	-11	-11	*		58	-41			
		F 384	73	0	1	4	-4	-4	-6	-4	-14	*	46	-27			
	0.25	M 1157	90	0	2	10	9	3	4	4	15	9	9	7	162	72	
		M 1158	79	1	2	6	14	2	3	3	4	-3	7	4	122	43	
		M 2211	74	-4	-4	-7	-3	-8	2	-8	*				42	-32	Emaciated
		M 2213	73	0	-2	4	0	-2	0	2	-3	-5	-10	10	67	-6	
		F 1150	69	3	5	0	13	6	5	3	4	0	5	3	116	47	
		F 1151	72	5	3	6	12	9	7	7	4	3	7	2	137	65	
		F 2216	76	1	-5	-2	1	1	-1	0	2	-2	-5	1	67	-9	
		F 2217	67	-2	-4	-5	-4	-13	*						39	-28	Emaciated
		M 476	88	7	12	19	3	8	1	-4	-4	-2	4	3	135	47	
		M 477	71	8	15	6	-1	0	3	0	5	3	2	11	128	57	
M 1148	76	3	8	4	17	3	12	8	2	2	2	4	141	65			
M 1149	79	10	9	9	17	1	7	9	2	0	5	-4	144	65			
M 2207	70	1	-2	5	1	-1	3	0	-1	1	2	4	83	13	Polyneuritic		
M 2210	77	4	-1	1	1	-2	-3	-1	0	3	-1	3	81	4			
F 459	77	13	17	3	10	3	7	-2	-7	6	5	5	137	60			
F 460	66	11	14	-1	3	7	4	1	5	2	5	-1	116	50			
F 1145	85	0	-2	-1	8	-1	2	6	5	-1	5	-2	104	19			
F 1147	72	8	3	6	14	7	5	8	9	0	7	-1	138	66			
F 2208	80	-5	-1	-1	3	-4	-7	2	1	2	1	-1	70	-10			
F 2212	62	-1	-4	-1	2	-1	0	-2	3	1	4	2	65	3			

* Died during experimental period.

F indicates female; M male.

TABLE 9

Change In Weight On Varying Quantities of Lamb Thymus																		
Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams											Final Weight Gms.	Net Gain or Loss Gms.	Remarks	
Thymus	0.05	M 352	114	9	2	-14	-11	-21	-7	*						72	-42	Emaciated
		M 374	106	-6	3	-3	-20	-13	*							67	-39	Emaciated, Polyneuritic
		F 357	108	-2	-5	2	-3	-3	3	-9	-4	-3	4	10	98	-10	Emaciated	
		F 385	79	0	3	-1	-11	-13	-12	*					45	-34	Emaciated, Polyneuritic	
	0.1	M 381	83	2	6	-6	-5	-5	-13	-11	*				51	-32	Emaciated, Polyneuritic	
		M 382	82	3	3	1	-2	-5	-10	-10	*				62	-20	Emaciated, Polyneuritic	
	0.25	M 1155	80	5	-1	-4	7	-3	3	1	1	-1	-2	2	88	8		
		M 1156	87	7	6	-3	4	0	6	0	3	1	7	-1	117	30		
		M 2280	66	0	-6	-8	-1	*							51	-15	Emaciated, Polyneuritic	
		M 2281	74	-3	2	-8	-8	-9	*						48	-26	Emaciated, Polyneuritic	
		F 1140	94	4	3	3	13	7	9	-3	0	-2	2	0	130	36		
		F 1144	88	9	-3	-1	11	-4	7	3	6	2	7	-2	123	35	Polyneuritic	
F 2291		62	-2	1	-1	-7	-12	*						41	-21			
F 2296		62	6	6	4	-7	-11	-4	0	3	6	-6	9	68	6			
0.5	M 1142	96	4	-1	-5	10	-4	10	2	5	1	5	6	129	33			
	M 1143	96	3	-6	-1	14	2	9	0	6	9	4	6	142	46			
	M 2287	63	2	8	-4	-18	*							51	-12	Emaciated		
	M 2288	62	3	2	7	-3	-2	-10	-3	*				56	-6	Emaciated		
	F 1138	115	0	3	-2	10	-2	5	1	-1	-1	1	-2	127	12			
	F 1139	107	-4	0	6	7	6	5	2	0	-3	5	2	133	26			
	F 2294	66	5	2	3	-12	-12	-3	*					49	-17	Emaciated		
	F 2295	61	1	2	-1	-13	-5	*						45	-16	Emaciated		

* Died during experimental period.

F indicates female; M male.

Vitamin B₂ (G) in Lamb Tissues and Organs (Tables 10 to 18, inclusive)

TABLE 10

Change In Weight On Basal Diet Only (Diet 555)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams										Final Weight Gms.	Net Gain or Loss Gms.	Remarks	
Controls	M	778	56	-5	-6	3	10	0	8	3	10	-1	-2	0	76	20	Paws sore, nose haemorrhagic
	M	779	52	-3	-2	0	8	-2	7	2	6	-2	-1	0	65	13	Paws sore, nose haemorrhagic
	M	782	71	7	7	9	-2	7	3	2	-1	-7	-7	-3	86	15	Fore paws swollen and cracked
	M	783	79	5	10	5	4	4	-5	-1	-2	-6	-7	-8	78	-1	Desquamation fore paws
	M	784	71	9	12	11	6	8	1	3	1	3	0	-1	124	53	Fore paws swollen and cracked
	M	785	70	2	11	6	11	-6	-1	1	-6	-5	-4	-6	73	3	Fore paws swollen and cracked
	M	786	51	4	8	4	4	3	1	-2	5	-1	0	-2	75	24	Fore paws swollen and cracked
	M	822	45	-4	-3	*									38	-7	
	M	868	60	0	-2	1	*								59	-1	
	M	879	70	-1	-2	4	4	4	-8	-7	15	-1	3	0	81	11	Fore paws, eyes, nose haemorrhagic
	M	896	84	6	0	6	-1	-2	-17	13	11	-3	-3	-4	90	6	Eyes and fore paws haemorrhagic, tail rough
	M	905	95	-9	-2	8	-1	-1	2	5	8	2	-4	-2	101	6	Eyes and fore paws haemorrhagic, mouth sore
	M	910	46	-1	5	0	-3	-3	5	0	-4	0	-3	-7	35	-11	Nose, mouth, fore paws and eyes haemorrhagic
	M	931	45	3	3	-6	-3	0	0	0	*				42	-3	Fore paws sore, partly eaten
	M	955	46	-3	-3	*									40	-6	
	M	974	72	9	0	5	-1	1	2	-2	0	1	1	-3	85	13	Fore paws, nose, mouth sore, eye rims reddened
	M	988	70	2	3	-7	0	-2	4	2	-4	1	0	1	70	0	Fore paws, nose, mouth sore, eye lids reddened
	M	1000	68	-5	-1	-3	-3	-14	*						42	-20	Fore paws and mouth sore
	F	788	71	6	11	5	11	0	-1	1	1	-3	-1	-5	96	25	Desquamation of fore paws
	F	789	66	0	8	3	3	-5	-3	-3	-2	-10	-2	-8	47	-19	Fore paws and tail sore, nose haemorrhagic
	F	790	66	8	6	4	3	-1	-2	-1	-3	-17	-1	-9	53	-13	Paws and tail sore, lower lip sore, nose haemorrhagic
	F	791	50	6	11	13	13	-2	-2	-1	2	-2	-2	-1	85	35	Desquamation of fore paws
	F	817	74	5	4	-5	-4	8	-4	-3	-5	5	1	0	76	2	Fore paws and nose haemorrhagic, mouth and tail sore

F indicates female, M male.

(Continued on Next Page.)

TABLE 10 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				-5	-1	-2	-3	-3	-8	4	0	2	0	2	0			
		F 833	67	-5	-1	-2	-3	-3	-8	4	0	2	0	2	53	-14	Fore paws and nose haemorrhagic, mouth sore	
		F 852	47	-1	-2	-2	-4	-6	*					32	-15	Fore paws sore		
		F 864	57	-1	-1	0	2	0	-7	9	4	7	-11	64	7	Fore paws and nose haemorrhagic, mouth sore		
		F 892	70	7	-3	4	-2	1	-4	2	4	0	3	86	16	Fore paws, nose, eyes haemorrhagic, tail sore and dirty		
		F 924	44	-5	0	0	-1	0	2	-2	-3	2	1	38	-6	Fore paws sore		
		F 944	51	1	2	-1	-4	0	-2	4	3	-3	-5	39	-12	Fore paws and nose sore		
		F 950	75	-3	-3	-1	-15	12	-7	-2	3	-1	1	59	-16	Fore paws and eyelids reddened, nose haemorrhagic		
		M 1656	53	0	-2	-3	-1	-4	0	2	2	-2	-1	45	-8	Fore paws and eyes red, mouth sore		
		M 1710	107	3	6	4	4	7	2	7	6	5	4	153	46	Paws haemorrhagic		
		M 1684	80	2	-1	4	-5	-10	-8	4	5	-4	1	61	-19	Fore paws, nose and mouth sore		
		F 1654	56	-4	-4	-7	-1	-5	*					35	-21	Paws and nose sore		
		F 1672	61	0	2	-9	-6	-2	-1	-10	*			35	-26	Fore paws sore, tail roughened		
		F 1677	56	0	10	-3	-3	-1	0	-5	-2	-2	3	50	-6	Fore paws sore, tail scaly		
		F 1705	63	-2	-6	-8	-8	*						39	-24	Fore paws, nose, tip of tail sore		
		F 1738	96	0	8	1	6	3	0	-2	-5	1	-4	104	8	Cataract in both eyes, fore paws sore, tail scaly		
		F 1745	106	5	6	4	11	11	2	1	1	2	9	160	54	Fore paws swollen		
		F 1755	71	3	5	2	4	6	9	-3	2	1	8	113	42	Hair out		
		F 1765	85	8	3	7	2	1	2	-1	-6	-4	4	99	14	Cataract right eye, fore paws, mouth sore		
		F 1770	100	2	1	0	5	3	0	2	-3	4	4	122	22	Cataract both eyes, fore paws, mouth sore		
		F 1782	91	3	3	2	3	11	0	1	-3	3	-1	116	25	Cataract both eyes, paws slightly sore, tail scaly		
		F 1725	93	-1	1	2	2	-3	-4	0	-13	3	-2	79	-14	Fore paws, nose, lower lip sore, tail scaly, eyes haem.		

* Died during experimental period.
F indicates female; M male.

TABLE 11

Change In Weight On Varying Quantities Of Meat

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
Meat	0.5	M 984	67	-3	4	1	5	3	1	4	2	-3	-2	-2	77	10	Cataract left eye, eye rim, fore paws reddened	
		M 985	63	2	2	4	3	5	2	2	3	1	-1	-2	84	21	Cataract left eye, fore paws sore	
		M 986	64	0	3	3	6	4	1	8	2	4	3	0	98	34	Fore paws sore	
		M 987	62	0	-1	4	3	3	9	-2	3	-1	3	-3	80	18	Fore paws, mouth sore, eye lids reddened	
		M 996	79	-2	2	-3	3	1	4	3	-2	-3	4	-4	82	3	Fore paws sore	
		M 997	78	-2	2	-2	4	2	1	-1	6	-8	-3	-3	74	-4	Fore paws, mouth sore	
		M 998	69	-2	-2	-4	4	1	-2	4	7	-4	0	-2	69	0	Fore paws sore, cataract left eye	
		M 999	83	-4	0	2	-1	5	9	-4	7	-6	-2	-6	83	0	Fore paws sore	
		F 991	78	1	3	0	-1	3	3	6	0	-3	-1	-5	84	6	Fore paws sore, mouth reddened, cataract both eyes	
		F 992	62	2	1	0	1	4	-2	5	3	1	0	1	78	16	Cataract right eye	
	0.75	M 909	64	7	1	7	7	6	3	6	15	1	8	9	134	70	Nose, eyes haem, base of tail, fore paws slightly haem and reddened	
		M 915	61	7	5	4	4	4	14	6	8	6	4	7	130	69	Eyes, nose, fore paws haem.	
		M 917	43	2	1	4	4	5	1	2	2	-1	4	5	72	29	Eyes, nose, fore paws haem.	
		M 918	53	4	5	5	6	6	7	6	7	5	5	9	118	65	Eyes, nose, fore paws, mouth, tail haem	
		M 946	79	3	3	6	4	4	9	6	12	-2	-1	8	131	52	Fore paws, nose, mouth, eyes reddened	
		F 920	66	5	2	-2	2	3	1	3	8	0	-1	4	91	25	Fore paws, nose, mouth, eyes reddened	
		F 921	65	6	1	0	1	1	3	5	5	1	0	2	90	25	Fore paws, nose reddened	
		F 922	59	-1	6	0	5	6	4	7	10	1	3	3	103	44	Fore paws reddened, nose haem	
		F 923	64	2	3	8	3	3	10	6	8	1	5	0	113	49	Fore paws, eyes haem	
		F 947	87	2	2	4	4	11	7	8	5	-1	-2	5	132	45		
1.0	M 902	85	2	2	3	11	6	4	2	16	3	6	4	144	59	Tail, fore paws haem		
	M 903	101	1	9	1	6	5	5	3	15	9	-5	8	158	57	Fore paws reddened, eyes haem, tail sore		
	M 904	93	-1	7	4	11	7	6	7	8	5	1	2	150	57	Fore paws, eyes reddened		
	M 908	83	1	3	9	6	8	10	6	11	1	-2	2	138	55	Eyes haem, fore paws reddened, tail rough		
	M 914	56	2	6	1	8	2	0	-3	6	-5	-2	-1	70	14	Fore paws bare		
	F 911	63	6	9	5	8	8	5	11	12	2	6	5	140	77	Fore paws, nose haem		
	F 912	70	1	10	8	12	12	3	10	12	9	6	7	160	90	Fore paws slightly red		

F indicates female, M male.

(Continued on Next Page.)

TABLE 11 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams											Final Weight Gms.	Net Gain or Loss Gms.	Remarks
		F 919	61	7	-1	3	11	8	2	7	8	6	4	5	121	60	Fore paws, nose haem
		F 948	88	5	5	0	1	22	-1	9	11	-3	0	9	146	58	Fore paws, eyelids reddened
		F 949	79	3	3	1	1	12	9	8	12	-6	-2	7	127	48	Fore paws haem, eyelids reddened
1.5		M 893	91	2	9	7	8	8	17	7	13	4	0	8	174	83	Fore paws, nose slightly reddened
		M 894	92	0	8	3	6	5	10	2	13	-3	0	4	140	48	Eyelids reddened, fore paw slightly dermatitic, tail rough
		M 895	94	-2	19	1	11	8	12	10	10	9	3	3	178	84	Base of tail, fore paw reddened
		M 898	91	7	14	3	10	8	10	10	15	4	1	2	175	84	Base of tail haemorrhagic, tail rough, fore paws sore
		M 899	88	0	12	5	4	4	27	7	8	10	7	6	178	90	Base of tail haem., fore paws and eyes sore
		F 897	74	1	12	2	12	4	9	8	16	-6	1	10	143	69	Fore paws slightly reddened
		F 900	84	3	8	7	5	5	10	15	12	7	6	8	170	86	Fore paws, end of tail sore, corners of eyes slightly sore
		F 901	88	-1	5	4	7	6	17	12	12	4	0	3	157	69	Eye haem., skin bare on fore paws
		F 906	92	0	5	3	8	6	21	10	16	3	0	2	166	74	Fore paws, nose and eyes sore
		F 907	87	-2	7	3	4	13	11	12	8	3	1	7	154	67	Fore paws and eyes sore
		F 913	31	3	1	4	7	6	14	9	9	6	5	15	110	79	Fore paws, eyes slightly red, tail rough

F indicates female; M male.

TABLE 12

Change In Weight On Varying Quantities of Lamb Liver																		
Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams										Final Weight Gms.	Net Gain or Loss Gms.	Remarks		
Liver	0.05	M 844	61	-1	-3	-4	-10	-6	*							37	-24	
		M 845	60	1	-1	-7	-7	3	4	-1	-2	2	-14	-1		37	-23	Fore paw sore
		M 846	64	-3	-1	-1	-9	-8	*							42	-22	
		M 847	60	-4	-4	-5	-9	-2	*							36	-24	
		M 867	79	-4	-2	4	-3	-2	-6	4	3	7	-5	-1		74	-5	Nose, fore paw haem.
		F 848	54	-1	-4	-6	-7	*								36	-13	
		F 849	57	1	-3	-2	-8	6	-8	2	0	1	1	-1		46	-11	Fore paws sore
		F 850	56	0	-1	-3	-8	-9	*							35	-21	
		F 851	55	-4	-5	-2	-3	9	-1	1	2	-8	-5	*		39	-16	Fore paws sore
		F 883	72	0	2	1	-5	-5	-12	-2	*					51	-21	
	0.1	M 853	76	1	-6	0	-1	1	-5	2	-1	0	-8	5		63	-13	Fore paws sore
		M 854	86	-7	-2	0	3	-2	-6	-5	-7	*				60	-26	Paws, nose sore
		M 876	81	3	3	5	1	2	-16	8	4	8	4	3		106	25	Nose, fore paws reddened
		M 877	68	1	1	7	-2	1	-9	-2	5	11	3	1		85	17	Nose, fore paws, eyes sore, tail rough
		M 878	82	1	3	5	5	9	-3	2	-1	4	-2	1		106	24	Fore paws reddened, nose haem., eye corners sore
		F 1655	52	2	5	4	2	0	5	2	2	-2	-1	-4		67	15	Fore paws quite sore, nose reddened, mouth sore
		F 1649	43	-1	-1	-1	-1	2	0	2	0	3	5	-1		50	7	Fore paws, nose sore
		F 1675	74	2	4	-3	3	-8	2	-5	12	4	1	0		86	12	Fore paws sore
		F 1676	76	-5	5	-5	-1	-5	2	1	1	7	-1	6		81	5	Fore paws sore
		F 857	59	-1	-2	0	-1	-3	-11	-3	*					38	-21	
		F 858	77	-1	-2	1	0	0	-10	11	-8	12	-5	-6		69	-8	Fore paws sore, nose haem.
		F 872	74	-4	0	0	-1	-2	-3	-4	10	9	-3	7		83	9	Fore paws, nose haem., eyes red
		F 873	68	0	4	-1	-5	0	-8	6	1	13	-3	1		76	3	Fore paws, nose, eyes haem.
		F 874	72	1	0	5	-3	-2	-12	-2	4	5	-1	5		72	0	Forepaws, nose, eyes, mouth haem
		M 1659	59	2	4	3	5	-5	3	-2	-1	-8	-7	-8		45	-14	Fore paws, nose sore
M 1661	55	6	4	5	6	0	1	0	-1	-8	-11	6		63	3	Fore paws, nose very sore		
M 1662	46	3	5	8	4	1	6	2	7	-3	5	-1		83	37	Fore paws slightly sore, tail scaly		
M 1670	53	1	6	1	8	2	4	-12	-3	-5	-5	6		56	3	Fore paws sore and bleeding		
M 1673	60	0	0	-6	-5	1	-3	-8	10	-2	1	2		50	-10	Paws, nose sore		
M 1674	57	10	1	-6	0	-4	2	-10	-10	*				40	-17	Fore paws, nose sore, tail rough		
0.15	M 859	84	0	-2	6	-2	-4	-2	5	1	-4	6	10		98	14	Nose, fore paws haem.	
	M 875	85	0	4	4	4	7	-7	1	3	4	-3	6		108	23	Nose, fore paws reddened	

F indicates female, M male.

(Continued on Next Page.)

TABLE 12 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of Rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams											Final Weight Gms.	Net Gain or Loss Gms.	Remarks	
				1	2	3	4	5	6	7	8	9	10	11				12
		M	886	100	1	-1	4	7	14	1	7	10	14	14	9	180	80	Fore paws, eyes slightly reddened
		M	887	97	2	0	4	7	16	-2	12	15	11	11	14	187	90	Nose, left eye haem.
		M	888	87	3	2	4	1	7	-6	5	10	-1	13	7	132	45	Fore paws, nose, mouth haem. and sore
		M	1644	54	2	1	2	5	2	7	3	2	3	9	2	92	38	Fore paws, tail sore
		M	1645	45	6	-1	1	4	1	3	5	2	0	9	-6	69	24	Fore paws, tail sore
		M	1646	48	1	-2	0	1	-1	1	4	0	-3	5	2	56	8	Fore paws, tail, nose sore
		M	1647	43	1	2	0	5	2	2	6	2	4	4	5	76	33	Fore paws sore
		M	1648	40	2	-2	1	6	-1	3	4	4	1	10	0	68	28	Fore paws, nose sore
		F	1650	53	3	5	9	11	5	-2	8	-5	-3	4	-1	87	34	Tail, fore paws slightly sore
		F	1651	46	4	1	0	4	2	6	2	6	-1	6	-3	73	27	Tail, fore paws, nose slightly sore
		F	1652	42	6	2	3	4	3	6	4	3	0	7	-3	77	35	Fore paws sore
		F	1653	47	-3	-3	-1	2	-2	0	2	1	-1	-3	-9	30	-17	Eyes red, polyneuritic
		F	1660	66	7	5	7	5	1	2	-2	6	-7	-1	-14	75	9	Tail scaly and blotchy
		F	862	63	0	-2	3	-3	-2	-9	-1	2	4	-2	7	60	-3	Fore paws bare, nose haem.
		F	863	68	-2	2	4	2	1	0	-4	4	19	3	9	106	38	Fore paws, nose haem.
		F	889	86	8	-3	0	0	1	-9	-5	7	1	2	3	91	5	Fore paws, nose eyes haem.
		F	890	84	4	0	3	-3	-3	-10	2	6	0	-1	0	82	-2	Fore paws, nose eyes haem.
		F	891	84	6	4	3	0	11	-6	0	4	0	2	1	109	25	Fore paws haem.

* Died during experimental period.

* indicates female; M male.

TABLE 13

Change In Weight On Varying Quantities of Kidney

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams											Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				2	1	-1	3	7	0	0	-9	-2	6	-1			
Kidney	0.1	M 807	88	2	1	-1	3	7	0	0	-9	-2	6	-1	94	6	Fore paws, nose haem, eye lids reddened, tail sore
		M 808	85	0	3	1	2	1	-6	-6	6	-11	17	7	99	14	Fore paws, nose, eyelids reddened, tail sore
		M 818	95	-5	1	1	1	0	2	3	9	5	9	7	128	33	Eyelids reddened, fore paws, nose haem.
		M 819	91	-4	2	1	2	2	1	3	13	2	5	17	135	44	Eyelids reddened, fore paws, nose haem.
		M 820	92	-5	2	-3	6	6	5	-1	21	5	5	14	147	55	Eyelids reddened, fore paws, nose, mouth haem.
		F 812	76	7	2	0	-1	-2	-6	-4	-4	4	6	3	81	5	Fore paws, nose haem, eyelids reddened, tail sore
		F 813	68	1	6	-1	-2	-1	-6	-7	5	-1	6	-4	64	-4	Fore paws, nose haem, eyelids reddened, tail sore
		F 823	76	-1	0	-1	-1	-1	-10	2	2	2	0	7	75	-1	Fore paws, nose haem, eyelids red
		F 824	77	-5	1	-1	-2	-3	-1	-8	12	11	9	9	99	22	Fore paws, nose haem, eyelids red
		F 825	80	-4	0	0	-3	-3	-5	1	7	8	4	11	96	16	Fore paws, nose haem., eyelids red
	0.15	M 806	104	1	3	1	-5	-9	7	14	-6	6	5	5	126	22	Fore paws, nose, eyelids, tail sore
		M 826	100	-11	-9	5	5	5	-1	5	14	9	7	7	136	36	Fore paws, nose haem, eyelids sore
		M 827	101	-5	3	-1	-5	-6	-10	6	12	7	-3	3	102	1	Fore paws bare, nose haem, eyelids reddened
		M 828	92	-5	5	0	5	5	5	2	9	5	6	7	136	44	Fore paws bare, nose haem., eyelids reddened
		M 829	79	-3	4	7	4	5	5	-1	7	5	5	11	128	49	Fore paws, nose, eyelids haem.
		M 1766	113	8	10	8	10	11	-2	4	-3	7	-1	10	175	62	Fore paws sore
		M 1767	113	6	10	1	12	10	-2	8	0	3	4	5	170	57	Cataract in right eye, fore paws, nose sore
		F 810	79	-3	-1	3	-5	9	2	7	1	2	9	4	107	28	Fore paws, nose haem, eyelids reddened, tail sore
		F 811	87	1	3	7	3	-5	-12	-4	-3	1	-3	11	86	-1	Fore paws, nose haem., eyelids reddened, tail sore
		F 816	65	10	7	1	-1	-3	2	12	-4	-4	4	4	93	28	Fore paws, nose haem., eyelids reddened, tail sore
F 830	83	-3	-5	0	-7	-8	4	-4	5	-1	3	5	72	-11	Fore paws, nose haem., eyelids reddened		
F 831	85	-8	6	-1	0	-1	2	5	11	14	8	8	129	44	Fore paws, nose haem., eyelids reddened		

F indicates female, M male.

(Continued on Next Page.)

TABLE 13 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams											Final Weight Gms.	Net Gain or Loss Gms.	Remarks
		F 1763	80	11	8	7	8	9	5	6	-1	2	9	5	149	69	Fore paws slightly sore, inside of mouth very sore and haem.
		F 1764	72	3	2	1	2	1	6	-11	-3	4	11	6	94	22	Fore paws very sore, tail tip sore, inside mouth haem.
		F 1726	99	4	9	0	6	2	-4	14	4	8	7	1	150	51	Cataracts in both eyes, fore paws slightly sore
		F 1727	105	7	13	5	17	3	-6	2	4	-5	8	-2	151	46	Nose, tip of tail sore and scaly
		F 1728	88	6	1	7	11	-2	-2	0	-2	3	0	2	112	24	Cataracts in both eyes, fore paws sore
	0.25	M 971	71	4	8	11	3	-2	6	2	6	-11	12	3	113	42	Fore paws, mouth sore, cataract both eyes
		M 972	80	8	11	15	3	6	0	1	2	-7	4	0	123	43	Nose sore, cataract both eyes
		M 973	77	-2	10	5	5	2	4	3	4	-5	14	2	119	42	Fore paws slightly sore, nose sore, cataract both eyes
		M 982	80	5	7	9	16	3	3	15	-2	2	7	0	145	65	Fore paws sore, cataract both eyes, left eye reddened
		M 983	65	3	6	7	11	0	1	10	3	1	2	-1	108	43	Cataract both eyes, fore paws red
		F 980	53	3	8	8	4	2	6	7	3	-2	8	3	103	50	Fore paws, nose sore, eyelids red
		F 981	63	2	7	12	3	0	4	6	9	-7	7	2	108	45	Fore paws, eyelids reddened, nose sore
		F 989	62	0	5	2	8	0	2	12	4	2	2	0	99	37	Fore paws sore
		F 990	67	1	1	13	10	0	1	12	0	2	4	2	113	46	Fore paws reddened, cataracts left eye
		F 993	58	1	2	3	7	3	-1	12	0	3	0	1	89	31	Cataract both eyes

F indicates female; M male.

TABLE 14
Change In Weight On Varying Quantities of Heart

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams											Final Weight Gms.	Net Gain or Loss Gms.	Remarks
Heart	0.1	M 729	76	-5	-1	-2	11	8	6	10	-1	7	9	0	118	42	Cataract right, left eyes
		M 730	89	-4	-10	-4	*	62	-18	Nose haem.							
		M 731	65	-5	2	3	13	6	6	18	7	13	3	10	141	76	Eyes reddened
		M 736	55	-4	-3	1	8	4	4	8	1	11	6	-1	90	35	Cataract both eyes, lips, forepaws haem.
		M 737	48	-5	-2	-4	*	37	-11								
		M 1718	84	1	0	-3	1	0	3	3	-3	8	0	-1	93	9	Cataract both eyes, nose, tip of tail, corner of mouth sore
		M 1719	87	6	-1	2	2	4	-1	7	-3	2	1	5	111	24	Cataract both eyes, fore paws, nose sore, mouth sore and scabby
		F 732	65	2	-2	6	1	12	7	6	3	10	11	9	130	65	Fore paws, lower lip haem.
		F 733	70	0	1	4	11	9	9	10	-2	6	7	7	132	62	Cataract both eyes, inner lower lip, fore paws haem.
		F 734	64	-2	-1	1	5	11	3	11	3	7	7	5	114	50	Cataract both eyes, fore paws, lip haem.
	F 741	49	-2	-5	1	10	2	5	3	1	4	-5	3	66	17	Cataract both eyes, fore paws, lip haem.	
	F 751	44	-2	0	-5	3	4	9	10	-3	6	11	8	85	41	Cataract right eye, fore paws, lip haem.	
	F 1480	106	7	6	8	0	10	-3	2	-8	3	5	3	139	33	Cataract right eye	
	F 1781	85	2	3	8	6	11	8	0	-5	3	6	1	126	41	Cataract both eyes	
	0.3	M 744	48	0	-2	0	6	14	8	12	-1	7	7	4	103	55	Lower lip haem.
		M 745	46	1	-2	-5	8	11	10	9	-2	5	4	2	87	41	Lower lip, forepaws, tongue haem
		M 752	54	6	3	8	8	10	7	18	3	10	10	7	144	90	Eye rims haem., cataract both eyes
		M 753	49	8	8	3	8	15	11	13	7	14	15	10	161	112	Cataract right eye
		M 776	54	0	-2	11	4	14	9	7	8	11	8	6	130	76	Lower lip haem., cataract right eye
		F 742	41	3	-4	8	4	9	6	8	-1	9	3	8	94	53	Cataract both eyes, fore paws, inner lip haem.
F 743		34	1	0	6	5	10	12	9	-1	4	5	8	93	59	Lip haem.	
F 748		54	1	-3	5	6	12	13	9	0	8	3	5	113	59	Lower lip haem., cataract both eyes, right paw slightly haem.	
F 749		47	2	2	1	5	11	8	13	-5	7	8	3	102	55	Cataract left eye	
F 750		39	2	5	-1	2	7	11	11	7	9	8	6	106	67	Cataract left eye	

F indicates female, M male.

(Continued on Next Page.)

TABLE 14 (Cont'd.)

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experi- ment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
0.5	M	755	63	10	4	2	16	15	18	19	0	6	5	9	167	104	Right eye haem., cataract	
		756	49	8	7	6	10	15	6	14	-9	8	7	8	129	80	Cataract both eyes	
		762	70	0	1	3	15	14	13	19	0	6	8	7	156	86	Right eye haem.	
		763	66	0	3	1	21	16	10	22	0	14	9	11	173	107	Cataract left eye	
		764	57	-4	3	5	14	17	12	22	2	10	5	18	161	104	Right eye haem.	
		739	54	7	-1	2	15	13	9	11	-5	10	5	9	129	75	Cataract both eyes	
		759	73	6	13	2	11	17	9	19	3	11	4	5	173	100	Lower lip, end of tail haem.	
		760	61	9	4	3	12	15	11	18	5	10	10	9	167	106	Cataract both eyes	
		773	51	4	2	3	6	13	7	5	12	6	12	3	124	73	Eyes haem., cataract	
		774	51	4	1	0	10	9	9	10	13	6	10	1	124	73	Eyes, lower lip haem.--	

* Died during experimental period.

F indicates female; M male.

TABLE 15

Change In Weight On Varying Quantities Of Tongue

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				1	2	-2	0	3	-1	2	6	0	1	4				
Tongue	0.1	M 925	66	1	2	-2	0	3	-1	2	6	0	1	4	82	16	Nose, fore paws haem, mouth sore	
		M 926	63	0	-1	0	-5	-4	-6	7	3	-1	2	5	63	0	Nose, fore paws haem, mouth sore	
		M 937	60	-3	-3	-1	-13	-3	*						37	-23	Fore paws sore	
		M 938	60	0	0	-2	-6	5	-6	1	2	-3	2	4	55	-5	Fore paws, nose haem.	
		M 952	77	1	2	-3	-7	-3	5	-1	8	-4	-1	6	80	5	Cataract right eye, fore paws haem, corner of mouth, eye rims reddened, tail dirty	
		F 934	54	-1	-3	-2	-3	-1	1	1	3	-4	5	3	53	-1	Fore paws, nose haem.	
	F 941	54	-1	-2	-2	-4	-3	1	-2	0	-11	*		30	-24	Fore paws, nose sore		
	F 942	52	1	1	-1	-5	-1	-2	-2	2	1	-3	0	43	-9	Fore paws haem.		
	F 943	58	-2	-2	-2	-5	-3	2	0	2	-5	1	1	45	-13	Fore paws haem, hind paws scaly		
	F 979	67	2	0	0	5	1	3	5	-3	-2	0	-6	72	5	Fore paws, mouth, nose sore, cataract left eye, eyelids reddened		
	0.3	M 927	69	-1	-1	1	-8	6	6	5	3	5	7	3	95	26	Fore paws, nose haem., mouth sore	
		M 928	69	0	0	3	-5	7	0	4	3	2	0	6	89	20	Fore paws, nose haem., mouth sore	
		M 939	64	0	0	-1	-6	5	-1	4	2	-1	-2	7	71	7	Fore paws haem.	
		M 940	57	-1	-2	-4	-1	1	-4	0	2	2	1	0	51	-6	Fore paws haem., mouth sore	
		M 953	75	1	2	2	-4	-1	3	5	5	-3	6	2	93	18	Fore paws haem., base of tail red	
		F 935	57	0	0	-2	0	3	0	3	-2	3	4	3	69	12	Fore paws, nose haem.	
		F 936	60	-1	-3	-1	-1	1	-2	-2	2	2	-2	4	57	-3	Fore paws, nose haem., eyelids reddened	
		F 956	65	1	1	0	1	4	0	4	3	-2	3	6	86	21	Fore paws, nose haem., eyelids reddened	
F 957		75	2	2	-11	9	4	3	8	10	1	3	1	107	32	Fore paws, nose, corners of mouth sore		
F 978		63	8	-2	6	0	7	5	6	-3	1	-1	1	91	23	Eyelids reddened		
M 929		60	0	0	0	-5	0	2	5	1	-5	4	6	68	8	Fore paws, nose haem., mouth sore left eye sore, haem.		
0.5		M 930	62	-2	-2	-2	-3	6	3	4	9	3	7	6	91	29	Fore paws, nose haem, eyes reddened, mouth sore	
	M 945	94	3	3	0	-5	4	4	7	7	1	7	6	131	37	Fore paws, nose haem, eye lids reddened		
	M 954	76	1	1	0	2	0	2	4	8	-4	5	6	101	25	Fore paws haem., tail sore		
	M 975	65	0	4	2	2	7	4	14	-3	6	5	-3	103	38	Fore paws, mouth, nose sore, eye rims reddened, cataract right eye		
	F 932	77	0	1	-1	-2	-4	-9	6	0	1	0	4	73	-4	Fore paws reddened		
	F 933	62	2	2	1	-1	0	0	5	0	5	5	10	91	29	Fore paws, nose haem., eyes reddened, tail dirty		
	F 951	80	-1	-1	-2	-1	0	-2	2	4	-2	7	6	90	10	Fore paws, eyelids reddened		
	F 976	63	0	3	2	3	2	5	6	3	0	3	-1	89	26	Fore paws sore, cataract left eye		
	F 977	62	4	5	2	0	8	6	6	1	5	8	4	111	49	Fore paws sore, eyelids reddened		

* Died during experimental period.
F indicates female; M male.

TABLE 16

Change In Weight On Varying Quantities Of Brain Tissue

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams										Final Weight Gms.	Net Gain or Loss Gms.	Remarks			
Brain	0.2	M 1701	76	0	-1	-4	-12	-6	*							53	-23	Fore paws, nose sore, tail rough	
		M 1678	82	5	-5	-3	-12	-8	-8	*						51	-31	Fore paws sore	
		M 1679	70	4	-2	3	-4	5	-5	12	2	3	-6			82	12	Fore paws sore	
		M 1682	73	-1	0	-2	-12	-12	*							46	-27	Fore paws sore, tail rough	
		M 1683	68	6	-6	2	-7	-5	-11	-1	*					46	-22	Fore paws, nose sore	
		F 1680	73	-2	-10	-5	-10	-3	*							43	-30	Fore paws sore	
		F 1681	84	4	-1	0	-5	-3	-4	-6	-7	6	-7			61	-23	Cataract left eye	
		F 1702	87	0	-4	0	-9	-2	1	0	0	-2	4			75	-12	Fore paws, nose sore, cataract right eye	
		F 1703	78	0	-2	-2	-5	-2	-3	-6	5	-4	5			64	-14	Fore paws, nose sore	
		F 1704	76	4	-2	1	1	3	-1	4	9	2	10			107	31	Fore paws, nose sore	
		0.4	M 1714	100	-2	1	4	26	9	8	10	9	2	6			173	73	Fore paws sore, cataract right eye
			M 1715	95	1	4	5	-1	-7	-8	4	0	-3	-3			87	-8	Fore paws sore, cataract left eye
	M 1685		69	3	-4	3	-4	-4	-13	*						50	-19	Fore paws sore, tail rough	
	M 1688		103	0	2	1	6	6	7	10	10	2	5			152	49	Fore paws, nose sore, left eye haem.	
	M 1689		108	0	1	15	2	7	10	14	6	1	15			179	71	Fore paws, nose, mouth sore, left eye haem.	
	F 1706		76	0	-1	3	-4	-4	0	-5	-2	-1	2			64	-12	Fore paws, nose sore	
	F 1707		71	-1	2	-6	-3	-3	3	-1	2	-8	9			65	-6	Fore paws, nose sore	
	F 1708		79	0	4	2	7	4	11	2	8	3	7			127	48	Fore paws sore	
	F 1709		68	0	2	-4	-3	2	-4	-1	0	-4	4			60	-8	Fore paws slightly sore, cataract right eye	
	F 1686		76	-8	-6	4	-6	-6	-7	10	4	4	4			69	-7	Fore paws sore	
	0.6		M 1692	109	5	0	-2	2	-3	-1	-2	0	-4	1			105	-4	Cataract both eyes
			M 1693	99	4	-3	5	7	-1	3	1	6	-1	12			132	33	Cataract left eye
			M 1711	100	-2	16	8	-18	-3	3	-2	0	-1	3			104	4	Cataract both eyes, fore paws sore
			M 1712	109	3	7	8	9	11	8	7	8	-1	7			176	67	Corner mouth, fore paws sore
			M 1713	103	-4	3	7	8	10	6	9	9	0	7			158	55	Cataract left eye, fore paws slightly sore
			F 1699	103	9	2	8	2	7	4	8	9	-3	10			159	56	Fore paws slightly sore, cataract both eyes
		F 1716	100	6	5	10	6	13	5	4	5	0	-2			152	52	Cataract right eye, fore paws sore	
		F 1717	101	6	6	7	2	9	1	5	6	3	6			152	51	Cataract left eye, fore paws sore	
F 1690		99	2	0	4	0	-2	-4	1	-1	-4	-1			94	-5	Fore paws sore		
F 1691		93	3	4	7	2	3	5	3	6	0	10			136	43	Fore paws sore		

Killed at 50 days

* Died during experimental period.

F indicates female; M male.

TABLE 17

Change In Weight On Varying Quantities Of Pancreas																		
Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				-3	-1	-6	0	-1	5	-6	1	2	2	1				
Pancreas	0.1	M 1729	91	-3	-1	-6	0	-1	5	-6	1	2	2	1	85	-6	Cataract right eye, fore paws, tail sore	
		M 1730	115	-4	10	5	2	14	4	5	-1	3	2	0	155	40	Cataract left eye, fore paws, nose sore	
		F 1734	98	-2	7	3	3	5	8	2	1	1	1	3	130	32	Cataract right eye, fore paws, nose sore	
		F 1737	81	-4	0	-6	-4	-3	5	-2	-8	6	-3	0	62	-19	Cataract both eyes, fore paws, nose sore	
	0.3	M 1731	100	3	9	7	11	12	2	7	-5	10	3	3	162	62	Cataract both eyes, fore paws, nose sore, mouth haem.	
		M 1733	106	6	14	11	6	9	7	4	1	9	6	4	183	77	Cataract left eye, fore paws, nose sore, corner of mouth scaly, inside of mouth haem.	
		F 1742	125	6	12	1	13	13	2	-2	-1	7	11	6	193	68	Cataract left eye, fore paws sore	
		F 1743	117	8	13	5	14	15	5	-4	2	0	6	4	185	68	Cataract both eyes, fore paws, nose sore	
	0.5	M 1739	120	9	14	6	16	13	7	8	1	9	8	6	217	97	Fore paws sore, toes sloughing	
		M 1740	122	6	12	10	12	10	8	1	-2	7	11	3	200	75	Fore paws, nose sore, toes on left foot very sore	
		F 1744	113	4	9	6	13	12	8	-5	0	4	3	5	172	59	Fore paws, nose haem.	
		F 1752	95	6	9	-4	21	4	11	-3	1	0	4	3	147	52	Cataract left eye, fore paws sore, corners of lip haem.	

F indicates female; M male.

TABLE 18

Change In Weight On Varying Quantities of Thymus

Dose	Amt. Per Day Gms.	Number of rat	Weight at Beginning of Experiment, Gms.	Gains Made Every Five Days, Grams												Final Weight Gms.	Net Gain or Loss Gms.	Remarks
				9	10	6	10	17	4	6	-6	9	6	0				
Thymus	0.1	M 1741	110	9	10	6	10	17	4	6	-6	9	6	0	181	71	Left paw, toes, fore paws sore, cataract left eye	
		M 1758	85	5	6	5	3	5	6	2	-1	2	10	-4	124	39	Cataract left eye, fore paws sore	
		F 1761	88	2	3	8	-3	2	3	1	-1	-1	12	-5	109	21	Cataract left eye, fore paws, tail sore	
	0.2	F 1762	89	9	2	8	9	4	5	1	0	0	6	-4	129	40	Fore paws, tail sore	
		M 1748	101	4	11	2	12	10	8	2	1	2	14	-2	165	64	Fore paws slightly sore	
		M 1749	101	4	5	7	10	10	10	-1	4	3	16	-4	165	64	Fore paws sore	
	0.3	F 1750	105	10	-1	7	11	5	12	-2	2	8	9	2	168	63	Fore paws sore, lips haem., cataract both eyes	
		F 1751	92	-3	7	5	2	6	1	2	2	6	13	1	134	42	Cataract both eyes, tail scaly	
		M 1756	103	4	7	8	10	8	3	0	-5	4	20	2	164	61	Fore paws very sore, tail sore	
		M 1757	83	10	3	13	4	3	7	-1	-6	3	7	0	126	43	Cataract both eyes, fore paws slightly sore, tip of tail sore	
		F 1753	90	3	7	6	12	8	3	3	5	11	17	4	169	79	Cataract both eyes, fore paws slightly sore, tail scaly, right tooth white	
		F 1754	91	8	8	4	14	8	3	1	2	2	9	6	156	65	Cataract both eyes, fore paws sore	

F indicates female; M male.