

**Rate of Growth and
Feed Consumption Standards
For Chickens Raised in Hawaii**

by

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INTRODUCTION

There have been numerous requests from poultrymen and persons interested in raising poultry for information on growth rates of chickens commonly raised in Hawaii and for the amounts of feed consumed within certain periods of time. It is recognized that such data would be useful to anyone who carefully considered the probable costs and returns from an investment in chicken rearing. The tables contained herein have been prepared from data accumulated from chickens reared under typical commercial conditions at the Hawaii Agricultural Experiment Station poultry farm, and within reasonable limits should provide a rapid estimate of body weight and feed consumption during 12 periods of growth up to 24 weeks of age. The data were procured from 748 New Hampshires, 295 S. C. Rhode Island Reds, 456 S. C. White Leghorns, and 750 crossbreds (Rhode Island Red X New Hampshire) during the spring and summer of 1949. Whereas these tables summarize the data for only 1 year, they should nevertheless be useful to Hawaii poultrymen, since these data were recorded under environmental and managemental conditions comparable to their own. None of the standards reported in the literature can comply with these criteria.

REVIEW OF THE LITERATURE

There are numerous references in the literature pertaining to this subject. Textbooks and reference books by Ewing(2), Heuser(3), Lippincott and Card (8), Winter and Funk(12), and others collectively contain data on rate of growth and feed consumption for the varieties of chickens that are raised in Hawaii. Experiment station bulletins containing this information have been written by Jeffrey(5), Kempster and Parker(7), and Hurd(4). Following a comparison with these standards of the rates of gain and efficiency of feed utilization by the varieties tested in this study, it became increasingly clear that these references were primarily of historical usefulness to Hawaii poultrymen. The rations fed a decade or more ago and the smaller growth capacity of chicks then reared resulted in standards for growth and feed utilization inferior to those commonly claimed today. The data presented in the following tables compare favorably with those found in recent papers by Dossin and Leuschner(1), Thompson et al.(11), Thayer and Thompson(10), and the subcommittee on poultry nutrition, National Research Council(9). It may therefore be assumed that these tables are typical for modern strains of chickens fed recently recommended chick starter and grower rations.

PLAN OF INVESTIGATION

Randomly selected standard-bred chicks from S. C. White Leghorn, S. C. Rhode Island Red, and New Hampshire varieties as well as Rhode Island Red X New Hampshire crossbreds were utilized in this study. The chicks were reared to 4 weeks of age in electric battery brooders and then transferred to another room and placed in grower batteries. They were vaccinated for fowl pox at that time. At 6 weeks of age the chicks were vaccinated with formalin inactivated Newcastle disease vaccine, separated according to sex, and moved to wire-floor developer pens. The pullets were given a second vaccination of formalized Newcastle vaccine at 18 weeks of age and moved to either laying pens or batteries. All birds studied were hatched during the period from December 12, 1948, to April 5, 1949.

Data on rate of gain and feed consumption were procured bi-weekly from all the birds in this study. Records on females were recorded to 24 weeks of age, but due to a critical shortage of feed in the Territory, the data on males were limited to 12 or 14 weeks following date of hatch. These standards represent the average rates of gain and feed consumption of all the strains within each variety that were maintained at this Station, as well as the averages for all hatches and rations fed.

RESULTS

The results of this study are shown in tables 1, 2, 3, and 4. The biweekly body weights for females are listed to 24 weeks of age, and those for males to 12 and 14 weeks. These weights are shown in the tables under the heading "Average body weights." Under the heading "Average feed consumption per bird" may be seen the amount of feed consumed during each time period by both sexes. As may be observed, the feed consumption was combined for both sexes during the first 6 weeks in tables 2 and 3, and to 8 weeks of age in tables 1 and 4. Subsequent feed consumption was recorded separately for the two sexes. Under the heading "Cumulative feed consumption" is given the cumulative average feed intake regardless of sex. Thus, in table 1, for example, the average feed consumed by the crossbred males and females combined was 15.13 pounds to 14 weeks of age. Subsequent feed consumption was for females only, but the average feed intake for both sexes until the time the males were sold was incorporated into that column. The amount of feed per pound of gain is given for the females from 12 to 24 weeks of age. As may be seen in tables 1, 2, 3, and 4 the efficiency of feed utilization decreased steadily between 12 and 24 weeks of age for all purebred and crossbred females studied.

DISCUSSION

Tables 1 through 4 of this circular are offered as a guide to poultrymen who may want to know the approximate body weights that the most popular varieties attain in Hawaii at various times during their growing period, as well as the amounts of feed consumed. As may be seen, the four tables include data for crossbreds (RIR X NH), New Hampshires, S. C. Rhode Island Reds, and S. C. White Leghorns. If one wants to know how much the males should weigh for these varieties, he will find this information in column 1 of these tables. Column 2 includes the same data for females to 24 weeks of age. Biweekly feed consumption is listed for males and females, respectively, in columns 3 and 4. From these columns, in table 1 for example, it may be seen that the crossbred females at 14 weeks of age weighed 3.37 pounds, that they consumed 2.96 pounds of feed between 12 and 14 weeks of age, that the cumulative average feed consumption for both sexes was 15.13 pounds, and that the amount of feed per pound of gain was 4.16 pounds.

Table 5 is included as a reference for rapid estimation of feed cost. It may be used as follows: According to table 1, the total average feed consumption of the crossbred males and females to 14 weeks of age was 15.13 pounds. For purposes of estimation let it be assumed that the average price for starter and grower mash is \$6.75 per 100 pounds. Using table 5, it can be quickly estimated that the total cost for feed was \$1.01, since 15.13 pounds is approximately midway between 14 and 16 pounds of feed. The calculated cost for the feed at 6.75 cents per pound is \$1.02. Similar estimations of feed cost can be made for New Hampshires, Rhode Island Reds, and White Leghorns by using tables 2, 3, or 4, respectively, along with table 5.

The efficiency of feed utilization by females at different ages may be seen in the last column of tables 1, 2, 3, and 4. As noted under the results, the efficiency of feed utilization decreased steadily between 12 and 24 weeks of age for all purebred and crossbred females.

SUMMARY

Four tables are included in this circular that may be used as references for the growth rates and feed consumption of New Hampshire, Rhode Island Red, White Leghorn, and crossbred (RIR X NH) chicks that were raised under conditions typical of commercial poultry farms in Hawaii. These tables include the average biweekly body weights and feed consumption for males to 12 and 14 weeks of age and for females to 24 weeks of age. The cumulative average feed consumption for both sexes and the efficiency of feed utilization

for females are also included. A reference table (5) may be used in conjunction with tables 1, 2, 3, and 4 for rapid estimation of cumulative feed cost.

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TABLE 1. Growth rate and feed consumption of (RIR×NH) crossbred chicks

AGE IN WEEKS	AVERAGE BODY WEIGHTS				AVERAGE FEED CONSUMPTION PER BIRD				Amount of feed per pound gain (♀ ♀ only)	
	Males		Females		Males		Females			Cumulative feed consumption† (♂ ♂ and ♀ ♀) Pounds
	Grams	Pounds	Grams	Pounds	Grams	Pounds	Grams	Pounds		
2	116.4*	0.26			211.4*	0.46			0.46	
4	279.0*	0.61			527.6*	1.16			1.62	
6	547.6	1.21	476.5	1.05	873.2*	1.92			3.54	1.84
8	897.2	1.98	736.7	1.62	1026.1*	2.26			5.80	2.57
10	1212.2	2.67	1008.8	2.22	1368.3	3.01	1120.4	2.47	8.54	3.73
12	1543.6	3.40	1309.7	2.88	1619.8	3.57	1263.0	2.78	11.71	3.83
14	2027.5	4.46	1532.2	3.37	1765.1	3.89	1345.6	2.96	15.13	4.16
16			1724.3	3.80			1355.6	2.99	18.12	4.47
18			1839.2	4.05			1324.5	2.92	21.04	4.91
20			2082.8	4.59			1478.1	3.26	24.30	5.05
22			2264.5	4.99			1745.1	3.84	28.14	5.60
24			2295.4	5.06			1832.3	4.03	32.17	6.13

* Both sexes combined.

† Females fed to 24 weeks of age and males fed to 14 weeks.

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TABLE 2. Growth rate and feed consumption of New Hampshire chicks

AGE IN WEEKS	AVERAGE BODY WEIGHTS				AVERAGE FEED CONSUMPTION PER BIRD				Amount of feed per pound gain (♀ ♀ only)	
	Males		Females		Males		Females			Cumulative feed consumption† (♂ ♂ and ♀ ♀) Pounds
	Grams	Pounds	Grams	Pounds	Grams	Pounds	Grams	Pounds		
2	111.1*	0.24			149.3*	0.33			0.33	
4	291.8*	0.64			425.7*	0.94			1.27	
6	608.1	1.34	535.3	1.18	866.0*	1.91			3.18	
8	864.0	1.90	777.5	1.71	1124.9	2.48	823.8	1.81	5.33	2.92
10	1308.8	2.88	1134.3	2.50	1217.9	2.68	994.2	2.19	7.77	2.87
12	1569.6	3.46	1341.6	2.96	1440.0	3.17	1154.1	2.54	10.63	3.28
14			1506.9	3.32			1262.7	2.78	13.41	3.76
16			1702.0	3.75			1207.4	2.66	16.07	4.04
18			1911.3	4.21			1258.8	2.77	18.84	4.26
20			2046.3	4.51			1450.2	3.19	22.03	4.68
22			2245.9	4.95			1727.0	3.80	25.83	5.03
24			2334.9	5.15			1827.0	4.02	29.85	5.61

* Both sexes combined.

† Females fed to 24 weeks of age and males fed to 12 weeks.

TABLE 3. Growth rate and feed consumption of S. C. Rhode Island Red chicks

AGE IN WEEKS	AVERAGE BODY WEIGHTS				AVERAGE FEED CONSUMPTION PER BIRD					Amount of feed per pound gain (♀ ♀ only)
	Males		Females		Males		Females		Cumulative feed consumption† (♂ ♂ and ♀ ♀) Pounds	
	Grams	Pounds	Grams	Pounds	Grams	Pounds	Grams	Pounds		
2	113.6*	0.25			178.8*	0.39			0.39	
4	277.9*	0.61			437.5*	0.96			1.35	
6	495.3*	1.09			747.7*	1.65			3.00	
8	801.6	1.76	702.9	1.55	942.8	2.08	825.0	1.82	4.95	3.11
10	1169.4	2.58	986.6	2.17	1255.4	2.76	992.4	2.18	7.42	3.23
12	1479.9	3.26	1162.0	2.60	1340.4	2.95	1006.8	2.22	10.01	3.54
14	1771.6	3.90	1389.0	3.06	1505.4	3.31	1164.9	2.57	12.95	3.85
16			1557.3	3.43			1192.6	2.63	15.58	4.20
18			1702.0	3.75			1240.6	2.73	18.31	4.57
20			1857.4	4.09			1206.8	2.66	20.97	4.84
22			1998.9	4.40			1274.9	2.81	23.78	5.14
24			2231.5	4.91			1452.4	3.20	26.98	5.25

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* Both sexes combined.

† Females fed to 24 weeks of age and males fed to 14 weeks.

TABLE 4. Growth rate and feed consumption of S. C. White Leghorn chicks

AGE IN WEEKS	AVERAGE BODY WEIGHTS				AVERAGE FEED CONSUMPTION PER BIRD					Amount of feed per pound gain (♀ ♀ only)
	Males		Females		Males		Females		Cumulative feed consumption† (♂ ♂ and ♀ ♀) Pounds	
	Grams	Pounds	Grams	Pounds	Grams	Pounds	Grams	Pounds		
2	91.1*	0.20			200.5*	0.44			0.44	
4	226.7*	0.49			481.9*	1.06			1.50	
6	460.4	1.01	405.2	0.89	743.4*	1.64			3.14	
8	728.4	1.60	602.6	1.33	942.2*	2.08			5.22	
10	960.8	2.11	750.0	1.65	1015.6	2.24	774.7	1.71	7.19	4.20
12	1267.8	2.79	970.2	2.14	1376.4	3.03	948.8	2.09	9.28	4.21
14			1133.5	2.50			976.4	2.15	11.43	4.47
16			1249.2	2.75			991.3	2.18	13.61	4.85
18			1340.9	2.95			927.4	2.04	15.65	5.21
20			1455.1	3.21			1022.2	2.25	17.90	5.49
22			1572.7	3.46			1155.7	2.55	20.45	5.84
24			1677.1	3.69			1138.3	2.51	22.96	6.15

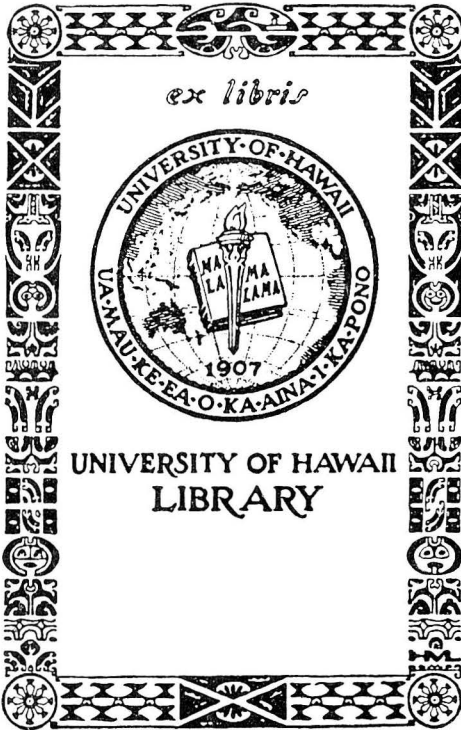
* Both sexes combined.

† Females fed to 24 weeks of age and males fed to 12 weeks.

TABLE 5. Reference table for rapid estimation of feed cost

CUMULATIVE FEED USED	PRICE PER POUND OF FEED									
	5.00¢	5.25¢	5.50¢	5.75¢	6.00¢	6.25¢	6.50¢	6.75¢	7.00¢	7.25¢
<i>pounds</i>										
6	\$0.30	\$0.32	\$0.33	\$0.34	\$0.36	\$0.38	\$0.39	\$0.40	\$0.42	\$0.44
8	.40	.42	.44	.46	.48	.50	.52	.54	.56	.58
10	.50	.53	.55	.58	.60	.62	.65	.68	.70	.72
12	.60	.63	.66	.69	.72	.75	.78	.81	.84	.87
14	.70	.74	.77	.80	.84	.88	.91	.94	.98	1.02
16	.80	.84	.88	.92	.96	1.00	1.04	1.08	1.12	1.16
18	.90	.94	.99	1.04	1.08	1.12	1.17	1.22	1.26	1.30
20	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45
22	1.10	1.16	1.21	1.26	1.32	1.38	1.43	1.48	1.54	1.60
24	1.20	1.26	1.32	1.38	1.44	1.50	1.56	1.62	1.68	1.74
26	1.30	1.36	1.43	1.50	1.56	1.62	1.69	1.76	1.82	1.88
28	1.40	1.47	1.54	1.61	1.68	1.75	1.82	1.89	1.96	2.03
30	1.50	1.58	1.65	1.73	1.80	1.88	1.95	2.02	2.10	2.18
32	1.60	1.68	1.76	1.84	1.92	2.00	2.08	2.16	2.24	2.32
34	1.70	1.78	1.87	1.96	2.04	2.12	2.21	2.30	2.38	2.46

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