

AGRICULTURAL EXTENSION SERVICE
NORTH CAROLINA STATE UNIVERSITY | AT RALEIGH

SCHOOL OF AGRICULTURE AND LIFE SCIENCES

OFFICE OF EXTENSION POULTRY SCIENCE

SCOTT HALL
Box 5307 ZIP 27607

September, 1968

I am enclosing the final summary of the Ninth North Carolina Random Sample Laying Test which you have requested. We believe that the information contained herein is a useful guide for evaluating egg production stocks. Please circulate this among your associates so that they, too, may study its contents.

This is the second complete test which compared all stocks under two growing environments and three laying environments. Environmental effects which were repeated this year established an expected pattern for our facility.

Requests for reports from this test should be sent to Piedmont Research Station, Route #6, Box 420, Salisbury, N. C. 28144.

We hope this information is useful to you.

Very truly yours,

Grady A. Martin
Grady A. Martin

Extension Poultry Specialist

GAM dj

FINAL SUMMARY REPORT
NINTH NORTH CAROLINA RANDOM SAMPLE LAYING TEST
March 24, 1967, through August 4, 1968

The North Carolina Random Sample Laying Tests are conducted under the auspices of the Agricultural Extension Service of North Carolina State University and the North Carolina Department of Agriculture. Mr. T. R. Burleson, Jr., Route 6, Box 420, Salisbury, N. C., 28144, is Resident Manager of the tests and Dr. G. A. Martin, Poultry Department, N. C. State University, Raleigh, N. C., 27607, is Project Leader. The purpose of the project is to assist poultrymen in evaluating stocks and management systems. A committee representing the various poultry interests in the state advises the Steering Committee in establishing policies and practices which best serve this purpose.



COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS. NORTH CAROLINA STATE UNIVERSITY AT RALEIGH, 100 COUNTIES AND U. S. DEPARTMENT OF AGRICULTURE COOPERATING

Data are presented as Tables 9-4A-1, II, III and IV, 9-4B-I, II, III and IV, 9-4C-I, II, III and IV, and 9-4D-I, II, III, IV and V. Tables carrying the letters A, B, C and D in their numbers contain performance data for birds housed on slats, on combination of litter and slats, in cages, and averaged across all three housing schemes, respectively. Due to the large number of items reported, each of the tables is divided into Parts I, II, etc., for the final report. These data are for one year at one location. The ARS 44-79 series of publications summarizes all laying tests in the United States and Canada over two years and may be obtained from the USDA. It provides an excellent basis for comparing the performance of different stocks.

INFORMATION CONCERNING DATA REPORTED

Some of the computing service for this project was provided under the terms of the National Institute of Health Grant No. FR-00011. Items reported are averages of pen or cage block means.

Chicks for each entry were hatched at the test site from a 1080-egg sample which was taken by public employees in Agriculture. The sample was taken as eggs were gathered at a randomly chosen supply flock, with the few exceptions shown on Page 5 when nest sampling was not feasible. A maximum of 352 sexed pullets was divided into four equal lots with 2 pens reared on slats at one sq. ft. per pullet and two pens reared on half slats-half litter at $1\frac{1}{2}$ sq. ft. per pullet. First week mortality, sexing errors, and accidental deaths were not charged against the entry. At 150 days of age a maximum of 50 randomly chosen pullets were retained in the pens where they were grown on floor space held constant and a maximum of 26 randomly chosen pullets were placed in a block of 10" x 18" laying cages at two birds per cage.

Allmash rations were mixed at the test site. A starting ration was fed for 8 weeks, a growing ration was fed for $13\frac{1}{2}$ weeks, and three laying rations were fed during early, mid, and late portions of the laying period. All birds were debeaked and vaccinated for Newcastle, bronchitis, pox, and Avian Encephalomyelitis. The birds which were permitted access to litter were inoculated with coccidiosis oocysts and fed a coccidiostat at a low level. Other management was as nearly commercial practices as practical.

RESULTS

Part I of Tables

Entry No. is assigned at random to the particular entry.

Type Housing. 1 = slats, 2 = slats and litter, 3 = cages, 0 = average of three types.

Breeder is the name used to distinguish entries. Full information about the stock and source is listed elsewhere in this report.

Average bird weight is recorded in pounds at housing and at end of test.

Egg size distribution (%) was obtained by crediting each week's production to size classes in proportion to those observed in the total production of one day. Individual eggs weighing between 23 and 26 oz/doz. are classified as large. Other size classes are scaled up or down from large in blocks of 3 oz/doz.

Average egg weight was obtained by crediting all eggs for each week at the average size observed on one day by mass weight.

Age at 50% production was the age of pullets on the first day of the first two consecutive days on which production reached or exceeded 50%.

Hen-Day Production Percentages represent the daily average number of eggs produced per 100 hens of the entry during the specified periods.

Eggs per Pullet Housed is the total number of eggs produced divided by the number of pullets housed.

Part II of Tables

Entry No. and Type Housing are same as above.

No. of Birds are the net pullets or hens retained at the specified times. Sexing errors, first week mortality and accidental deaths are excluded.

Mortality is the percentage of birds that died during growing and laying periods and the average days per bird housed that were lost to mortality during the laying period.

Feed Consumed is average feed consumed for the 150 days of growing, per 100 birds per day in laying period, per pound of eggs produced in laying period, and per dozen eggs laid.

Chick Price is the average of prices quoted for this stock in March of 1965, 1966 and 1967.

Values per Pullet Housed are the amounts charged or credited to the entry at 3-year monthly average feed prices quoted by N. C. Department of Agriculture, at 3-year weekly egg prices quoted for Raleigh market by the Federal State Market Service, and three-year average fowl prices at Raleigh for the week in which the test terminated. IOFCC is income over laying feed cost and growing chick and feed cost. This does not represent net return since many other costs are involved in egg production.

Part III of Tables

Entry No. and Type Housing are same as above.

% Loss (Downgrades) was the percentage by which total egg value was reduced below Grade A value due to downgrades detected from candling. We express our appreciation to the N. C. Department of Agriculture, Egg Law Enforcement Section, whose personnel provided candling service on one day of production each month. Market value of all eggs was calculated on the basis of these candling reports.

% Inclusions (breakout): Blood spots and colored meat spots were observed by breaking one day's production from each pen at about 30-day intervals throughout the year. Spots exceeding 1/8 inch were classified as large and those of lesser size as small. Breakout data were not used for egg value calculations.

Candled Quality Percentages: Official graders from the N. C. Department of Agriculture candled the production of one day each month. The percentages reported are a summary of their findings and were used to determine egg value.

Haugh Units were measured one day each quarter of the year. Since this factor undergoes seasonal change, the quarterly averages and the annual average are given.

Shell Score (specific gravity) was secured by using salt solutions to determine the specific gravity of eggs. The eggs with specific gravity below 1.068 were given score of 0; those between 1.068 and 1.072, a score of 1, etc., with those exceeding 1.100 receiving a score of 9. One day's production from each pen was classified in the months indicated.

Part IV of Tables

Entry No., Type Housing and Breeder are the same as above.

Causes of Mortality were assigned from autopsy findings. Birds were held in a freezer as mortality occurred and examined at the N. C. Department of Agriculture Poultry Disease Laboratory once each week. We express our appreciation to Dr. W. W. Clemmons for providing this service to the Test. We plan to follow the 10-point classification recommended by the Council of American Official Poultry Tests in our Tenth Laying Test.

Part V of Tables

This section of the tables is presented only for the average performance of the entries in all types of housing and for only the four characteristics listed.

The Range column indicates those entries which are in the most desirable half of the range from the mean by 1, those between this point and the mean by 2, those in the least desirable half of the range beyond the means by 4, and those between this point and the mean by 3.

Entry No. indicates which stock from earlier listing in the tables attained the average performance value shown.

The Duncan Test may have little meaning to those who are not accustomed to statistical procedures. Basically, this test indicates that difference greater than those spanned by any one of the vertical lines would not be expected to occur more than five times out of 100 comparisons if all stocks had the same ability to produce. Few of us can insure 19 to 1 odds in our favor on daily business transactions. Observing the stocks in more than one test and more than one year can help ascertain the margin of economic feasibility in stock selection.

Breeder	Stock Identification	Sample Proced.*	Source of Sample
Babcock Poultry Farm, Inc. Box 280, Ithaca, N. Y.	Babcock B-300 WL 3wX	A	Harrold's Hatchery Winterville, Ga.
Cashman Leghorn Farms Webster, Kentucky	Cashman Hi-Cash WL INX	A	Cashman Leghorn Farms Webster, Ky.
Colonial Poultry Farms, Inc. Pleasant Hill, Missouri	True-Line 365-B WL INX	A	Colonial Poultry Farms Inc., Cullman, Ala.
Joe K. Davis Hatchery Earl, N. C.	Davis RIR SX	A	Joe Davis Hatchery Earl, N. C.
Joe K. Davis Hatchery Earl, N. C.	Combiner Sex-Link RIRxBPR BX	A	Joe Davis Hatchery Earl, N. C.
Garber Poultry Breeding Farm Modesta, California	Garber GX 291 CGxWL	A	Joe Davis Hatchery Earl, N. C.
Heisdorf & Nelson Farms Kirkland, Washington	H&N "Nick Chick" WL SX	A	J. C. Castlebury Poultry Farm, Apex, N. C.
Honegger Farms Co., Inc. Forrest, Illinois	Honegger Layers WL 3wX	A	Fred Haley Hatchery, Inc. Canton, Ga.
Hubbard Farms, Inc. Walpole, N. H.	Hubbard Golden Comet NHxSyn. BX	A	Hubbard Farms, Inc. Statesville
Hy-Line Poultry Farms Des Moines, Iowa	Hy-Line 934 IBX	A	Tar Heel Chicks, Inc. Monroe, N. C.
Hy-Line Poultry Farms Des Moines, Iowa	Hy-Line 934-E IBX	A	Tar Heel Chicks, Inc. Monroe, N. C.
Ideal Poultry Breeding Farms, Inc. Box 710, Cameron, Texas	Ideal 236 4wBX	A	Ideal Poultry Breeding Farm, Cameron, Texas
Ind. Farm Bureau Cooperative, Indianapolis, Ind.	Princess 55 WL SX	A&B	Cooperative Breeding Re- search Fm. Lafayette, Ind.
Kimber Farms, Inc. Fremont, California	Kimber K-137 WL SX	A	Hubbard Farms, Inc. Statesville, N. C.
Kimber Farms, Inc. Fremont, California	Kimber K-141 WL SX	A	Kimber Farms, Inc. Fremont, California
Parks Poultry Farm Altoona, Pa.	Parks Keystones B-1 WL SX	A	Parks Poultry Farm Altoona, Pa.
Shaver Poul.Breeding Fms. Ltd. Galt, Ontario, Canada	Shaver Starcross 288 WL 3wX	B	Mid-Valley Hatchery Dayton, Va.
Stone's Poultry Breeding Farm Dinuba, California	Stone's H-56 WL SX	A	E. H. Underwood Bogart, Ga.
Sturtevant Farms Halifax, Mass.	Sturtevant Black Sex Links RIRxBPR	B	Sturtevant Farms Halifax, Mass.
Welp's Breeding Farm Bancroft, Iowa	Welp Line 937 WL SX	A	R. G. Smith Flowery Branch, Ga

*A = nest sample; B = egg room sample; and C = incubator tray sample

Table 9 - 4A - I - Bird Weight, Egg Size, Maturity and Production Data

Entry No.	Housing Type	Breeder	Average	Egg Size, Distribution (%)					50% at Production	Egg Production Rate	50% After Production	50% per Egg Pulled Housed						
				50 Days	500 Days	Pee Wee	Small	Medium										
1 1	Davis (Sex Lk.)	4.7	5.9	0.0	0.2	4.3	16.5	79.0	28.4	187.0	47.8	69.6	59.4	56.2	54.0	63.0	185.3	
2 1	Kimber (K-137)	3.3	4.0	0.3	1.6	12.9	39.8	45.4	26.0	175.0	56.7	72.7	62.6	62.9	59.7	67.4	207.4	
3 1	Welp's (937)	3.1	3.9	0.3	0.6	0.2	31.1	58.8	26.8	175.0	55.0	74.1	66.3	58.4	56.0	67.3	179.6	
4 1	Shaver (#X288)	3.5	4.8	0.1	0.7	5.6	27.4	73.2	27.6	177.5	59.4	84.2	79.9	72.3	68.6	78.1	194.0	
5 1	Ind.Fm.Bu. (P.55)	3.1	4.2	0.1	0.7	3.2	32.3	58.7	27.0	182.0	49.6	73.1	65.9	61.1	56.8	67.3	182.2	
6 1	Garber (GX291)	3.9	4.9	0.3	0.9	11.3	27.9	59.7	27.0	180.0	52.3	63.5	60.3	52.6	47.5	60.2	175.4	
7 1	Hubbard (Gld.Com)	4.3	4.8	0.1	0.3	5.8	19.6	73.2	28.4	173.0	61.3	73.3	59.6	51.8	47.5	64.8	201.8	
8 1	Colonial (365-B)	3.7	4.1	0.3	1.9	12.3	34.6	51.0	26.5	175.0	59.1	69.6	63.9	57.9	56.1	65.8	184.6	
9 1	Cashman (Hi-Cash)	3.5	4.8	0.0	0.5	0.5	9.2	35.4	54.0	26.7	182.5	47.1	76.4	73.1	66.6	61.2	71.1	174.1
10 1	Heisdorf & N (NC)	3.0	4.4	0.1	1.3	11.6	34.8	52.3	26.6	179.0	51.0	76.5	66.1	62.1	58.4	68.8	159.2	
11 1	Kimber (K-141)	3.2	4.2	0.1	1.1	10.7	30.2	48.9	26.4	185.5	40.4	70.4	62.4	63.3	61.2	66.2	170.1	
12 1	Stone (H-56)	3.3	4.6	0.1	1.3	12.4	38.6	47.6	26.2	168.5	63.3	77.2	71.2	67.7	65.6	73.0	204.5	
13 1	Hy-Line (934-E)	3.1	3.9	0.1	0.4	5.0	19.1	76.4	28.3	176.5	52.5	72.4	63.5	62.8	57.7	66.8	183.5	
14 1	Ideal (236)	3.2	4.3	0.2	1.1	11.3	36.1	51.2	26.4	175.5	55.0	68.9	62.7	62.2	58.4	65.7	186.8	
15 1	Babcock (B-300)	3.3	4.3	0.6	1.8	11.2	30.6	55.8	26.6	166.5	66.0	73.0	67.9	64.9	61.1	69.6	188.4	
16 1	Hy-Line (934)	3.1	3.9	0.9	0.4	6.3	20.0	72.4	27.7	190.0	52.6	73.0	67.2	68.1	65.2	69.9	200.1	
17 1	Honegger (Layers)	3.4	4.5	0.4	1.1	10.4	37.2	50.9	26.4	174.5	58.3	74.2	70.3	69.7	70.4	71.3	169.8	
18 1	Davis (RIR)	4.5	6.4	0.0	0.5	4.2	28.6	66.7	27.5	105.0	41.8	67.3	59.0	52.9	48.0	60.7	187.5	
19 1	Sturtevant (SxLk)	4.7	5.7	0.0	0.3	3.9	20.9	75.0	28.3	191.0	43.1	67.2	57.0	57.3	52.1	60.7	171.5	
20 1	Parks (Keystone)	3.5	4.7	0.2	1.1	9.3	30.8	58.6	26.9	172.5	61.3	76.6	68.3	61.4	55.3	70.3	225.8	
101 Averages		3.5	4.6	0.2	0.9	8.8	29.6	60.5	27.1	178.6	54.3	72.7	65.3	61.6	58.0	67.4	186.6	

Table 9 - II - Birds, Mortality, Feed Use and Cost and Income Data

Entry No.	Type Housing	No. of Birds	Mortality	Feed Consumed	Value per Pullet Housed			
					Days 151-500	Days 8-150	Days 1-150	Days 1-50
1	1	95.	92.	77.	3.5 16.3 31.9 21.0 27.3 3.17 5.63	3.4 0.94 4.12 5.41	5.03	.36-0.031
2	1	111.	100.	81.	2.4 19.0 36.2 17.1 25.4 2.91 4.73	3.7 0.75 3.77 4.90	5.37	.20 0.660
3	1	97.	96.	71.	1.4 26.0 66.6 17.0 24.9 2.82 4.72	3.7 0.74 3.34 4.45	4.86	.17 0.585
4	1	91.	83.	57.	8.7 31.1 85.1 19.7 28.3 2.70 4.63	3.4 0.98 3.55 4.80	5.20	.20 0.596
5	1	97.	90.	67.	6.9 25.9 54.7 16.7 24.9 2.87 4.83	3.9 0.75 3.48 4.65	4.87	.19 0.404
6	1	96.	91.	72.	5.4 20.9 43.7 18.8 25.1 3.12 5.26	3.2 0.85 3.63 4.82	4.57	.23-0.021
7	1	113.	100.	84.	1.7 16.0 24.6 21.7 26.6 2.90 5.15	3.5 0.90 4.10 5.35	5.41	.27 0.331
8	1	102.	98.	74.	3.9 24.6 55.9 17.3 25.2 2.81 4.83	3.9 0.77 3.51 4.68	4.90	.19 0.403
9	1	90.	84.	57.	5.9 32.5 87.4 19.3 26.7 2.97 4.96	3.6 0.83 3.41 4.63	4.67	.19 0.233
10	1	116.	100.	61.	3.4 39.0 98.2 16.0 24.4 2.80 4.65	3.1 0.71 2.92 3.95	4.31	.16 0.519
11	1	95.	88.	60.	7.6 31.8 70.7 15.9 24.3 2.90 4.79	3.7 0.76 3.22 4.39	4.54	.17 0.336
12	1	99.	93.	74.	6.7 20.5 56.9 18.0 26.3 2.77 4.53	2.9 0.80 3.64 4.76	5.42	.22 0.881
13	1	113.	100.	73.	1.7 27.0 67.7 17.5 26.9 2.92 5.16	4.7 0.77 3.67 4.91	4.84	.17 0.095
14	1	109.	100.	84.	4.3 16.0 34.6 16.8 25.4 2.98 4.91	3.8 0.75 3.78 4.93	5.22	.22 0.508
15	1	110.	100.	67.	6.0 33.0 73.0 17.2 25.9 2.76 4.60	3.6 0.75 3.40 4.54	4.94	.17 0.467
16	1	113.	100.	90.	2.9 27.0 47.4 17.1 25.0 2.77 4.78	4.7 0.75 3.77 5.00	5.33	.19 0.517
17	1	103.	99.	64.	3.8 35.3 97.3 19.3 25.4 2.75 4.54	3.5 0.82 3.04 4.22	4.50	.17 0.449
18	1	102.	100.	94.	1.9 6.0 10.4 21.8 25.4 3.21 5.52	3.4 0.95 4.07 5.37	4.99	.37-0.119
19	1	95.	90.	74.	4.9 17.8 42.6 22.4 27.2 3.32 5.87	3.2 1.00 3.96 5.30	4.61	.38-0.313
20	1	110.	100.	94.	4.8 6.0 13.1 17.7 27.0 3.89 4.85	3.6 0.78 4.31 5.47	6.09	.27 0.879
Av. 1		103.	95.	73.	4.4 23.2 54.0 19.3 25.0 2.92 4.95	3.6 0.81 3.63 4.83	4.97	.22 0.369

Table 9 - 4A - III - Egg Quality Data

Entry No.	Type	Housing	% Loss grades)	(down-				Haugh Units	Shell Score (Specific Gravity)												
				Large Bloods	Small Bloods	Large Meats	Small Meats		A or Better	B	C	Chex & Cracks	Sept.	Dec.	April	June	Average	October	January	April	July
1	1	4.2	1.4	2.2	7.4	27.2	91.5	2.3	9.0	5.9	0.3	84.7	79.9	77.3	71.3	78.3	3.75	3.46	1.92	1.33	2.62
2	1	4.2	0.8	1.1	0.3	0.7	92.1	1.2	0.0	6.2	0.4	87.5	85.0	78.6	78.7	82.4	5.12	5.35	4.79	3.011	4.39
3	1	3.5	1.0	2.2	0.3	1.1	93.1	2.5	0.2	3.2	1.1	85.2	79.9	77.1	74.6	70.2	3.00	4.27	3.017	1.87	3.23
4	1	4.8	0.4	1.5	0.4	0.5	92.0	0.9	0.2	5.8	1.1	82.3	79.0	75.0	74.1	77.4	4.52	4.21	3.11	2.03	3.47
5	1	4.7	0.4	1.4	0.0	0.7	91.2	1.4	1.2	6.5	0.7	92.3	87.9	81.9	79.0	85.3	4.62	3.97	3.39	2.11	3.52
6	1	6.2	0.7	1.8	0.0	0.5	98.7	2.1	0.6	7.2	1.4	83.9	79.2	76.5	75.3	78.7	4.42	3.95	2.79	1.21	3.19
7	1	5.5	1.2	0.7	1.4	3.0	0.9	0.6	0.2	6.6	1.7	84.8	81.7	76.3	71.9	78.6	2.88	2.64	1.77	0.75	2.11
8	1	4.6	1.0	0.5	1.1	0.1	3.3	3.2	0.3	4.3	0.8	84.4	81.1	72.9	75.5	78.4	4.09	4.70	3.45	2.56	3.95
9	1	3.8	2.4	2.7	0.0	0.7	92.9	1.3	0.2	4.7	0.0	84.1	81.2	74.4	71.9	77.0	4.88	4.45	2.90	1.53	3.46
10	1	3.0	0.6	0.9	0.0	0.4	94.1	2.4	0.2	5.9	0.4	92.0	85.7	81.4	79.3	84.6	4.69	4.72	3.50	2.41	3.83
11	1	4.3	1.3	2.1	0.2	0.4	92.1	2.5	0.0	4.0	1.4	86.0	83.0	75.0	71.2	78.3	5.10	4.81	3.56	2.24	3.92
12	1	4.6	0.4	1.2	0.2	0.2	82.0	1.7	0.2	4.7	1.5	87.5	83.0	77.4	73.0	80.4	4.22	4.49	3.43	1.97	3.53
13	1	5.2	1.1	1.4	0.3	1.1	89.7	3.5	0.5	5.8	0.5	81.1	77.5	72.7	67.5	74.7	5.33	4.89	3.46	1.71	3.85
14	1	4.1	0.6	1.0	0.7	0.4	92.2	1.2	0.0	6.3	0.3	81.3	77.5	74.2	81.0	78.5	4.60	4.61	3.22	2.16	3.65
15	1	7.5	3.0	1.4	0.3	0.2	86.9	0.5	0.2	10.9	1.6	92.1	77.6	73.6	70.6	76.0	4.23	3.69	2.92	1.45	3.05
16	1	5.0	0.7	0.9	0.9	0.9	91.1	1.1	0.0	6.8	1.0	81.2	77.7	74.3	74.3	76.9	5.09	4.46	3.54	2.13	3.80
17	1	4.9	0.7	1.5	0.0	0.3	91.2	1.9	0.2	5.9	0.9	85.2	82.9	76.5	74.4	79.9	4.69	4.96	3.89	1.95	3.87
18	1	7.2	0.9	1.5	6.9	21.6	88.2	1.9	0.0	7.1	2.7	85.3	80.6	77.5	72.0	78.3	2.76	2.61	2.05	0.89	2.08
19	1	4.8	0.6	1.6	14.2	22.6	91.5	1.1	0.0	6.2	1.2	85.2	81.8	77.9	74.7	79.0	2.94	2.93	2.03	1.00	2.23
20	1	3.4	0.9	1.7	0.2	0.1	91.6	1.3	0.0	4.6	0.5	86.7	83.0	77.8	74.8	80.5	4.92	4.96	3.72	2.97	4.14
AV.	1	4.9	1.0	1.5	2.1	5.5	91.3	1.7	0.1	5.8	1.0	85.1	81.0	76.5	74.3	79.2	4.38	4.21	3.10	1.86	3.39

TABLE 9 - 4A - IV. CAUSES OF MORTALITY

Entry No.	Type Housing	Breeder	Mareks and Leukosis	Perito-nitis		Reprod. Disorders		Misc. and Unknown		No Autopsy		Total Mortality	
				8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days
1	1	Davis (Sex Link)	2.8	7.8	-	-	1.1	-	5.4	0.7	-	3.5	16.3
2	1	Kimber (K-137)	1.8	10.0	-	-	2.0	-	7.0	0.6	-	2.4	19.0
3	1	Welp's (937)	-	20.8	-	-	2.1	-	2.1	1.4	1.0	1.4	26.0
4	1	Shaver (*X288)	4.3	26.4	-	1.2	0.7	1.2	3.6	1.2	8.7	31.1	
5	1	Ind. Fm. Bu. (P.55)	2.1	20.2	-	-	2.3	2.8	1.1	2.0	2.2	6.9	25.8
6	1	Garber (GX 291)	4.1	14.3	-	-	2.2	-	4.4	1.4	-	5.4	20.9
7	1	Hubbard (Gold.Com)	0.6	9.0	-	-	2.0	0.6	5.0	0.6	-	1.7	16.0
8	1	Colonial (365-B)	0.6	15.3	0.6	2.1	-	1.3	6.2	1.3	1.0	3.9	24.6
9	1	Cashman (Hi-Cash)	1.5	26.5	-	-	-	0.7	6.0	3.7	-	5.9	32.5
10	1	Heisdorf & N (NickC)	1.7	29.0	-	-	1.0	-	7.0	1.7	2.0	3.4	39.0
11	1	Kimber (K-141)	2.8	27.3	-	-	2.3	1.4	1.1	3.5	1.1	7.6	31.8
12	1	Stone (H-56)	2.7	18.3	-	-	1.1	2.0	1.1	2.0	-	6.7	20.5
13	1	Hy-Line (934-E)	0.6	18.0	0.6	1.0	1.0	-	7.0	0.6	-	1.7	27.0
14	1	Ideal (236)	2.4	10.0	-	1.0	-	5.0	1.8	-	4.3	16.0	
15	1	Babcock (B-300)	0.6	20.0	-	1.0	3.0	7.0	2.4	2.0	6.0	33.0	
16	1	Hy-Line (934)	0.6	10.0	-	-	1.0	1.8	8.0	0.6	1.0	2.9	20.0
17	1	Honegger (Layers)	0.6	24.2	-	2.0	-	5.0	3.1	2.0	3.8	35.3	
18	1	Davis (RIR)	0.6	2.0	-	2.0	0.6	1.0	0.6	1.0	1.9	6.0	
19	1	Sturtevant (Sx.Lk.)	3.5	11.1	0.7	1.1	-	3.3	0.7	2.2	4.9	17.8	
20	1	Parks (Keystone B-1)	1.8	3.0	-	-	1.2	3.0	1.8	-	4.8	6.0	
1	Average		1.8	16.2	0.1	0.5	1.3	0.8	4.3	1.7	0.8	4.4	23.2

Table 9 - 4B-1 : Bird Weight, Egg Size, Maturity and Production Data

Breeder	Body Wt.	Egg Size Distribution (%)						Egg Production Rate					
		150 Days	500 Days	Pee Wee	Small	Medium	Large	Ex. and Over	Wt. Egg oz./doz.	Wt. at Production	50% Production	151 Days	240
Entry No.	Type Housing											241 Days	330
1 2 Davis (Sex Lk.)	4.0 9 6.3	7.4	10.4	7.1	23.0	50.9	27.5	174.0	60.9	60.9	60.4	63.7	59.9
2 2 Kimber (K-137)	7.0 9 4.3	7.1	10.7	19.3	45.3	33.4	25.3	174.0	66.2	78.5	85.0	64.1	62.0
3 2 Welp's (937)	7.9 4.2	10.0	1.6	16.0	45.1	37.3	25.4	176.5	58.4	75.6	72.1	64.4	63.2
4 2 Shaver (*X288)	3.6 4.9	7.0	7.0	8.2	31.1	60.8	27.1	171.5	65.2	84.6	78.6	74.7	74.4
5 2 Ind.Fm.Bu. (P.55)	3.0 2 4.3	0.2	1.0	12.0	36.0	50.1	26.4	176.5	60.9	80.0	73.4	70.4	70.9
6 2 Garber (GX291)	3.0 7 5.1	7.1	1.3	14.4	36.1	48.3	26.2	171.0	65.4	92.4	71.7	60.7	55.9
7 2 Hubbard (Gld.Com.)	4.1 5.3	10.0	7.5	4.6	10.4	75.5	28.1	175.0	66.0	77.5	69.1	57.6	54.0
8 2 Colonial (365-B)	3.0 3 4.4	7.4	2.5	15.4	34.9	45.9	25.7	170.5	64.0	76.7	73.1	64.9	62.6
9 2 Cashman (Hi-Cash)	3.4 4 4.0	0.1	0.6	11.3	36.5	51.5	26.3	179.5	58.5	82.7	74.7	70.0	68.3
10 2 Heisdorf & N (NC)	3.7 7 4.3	7.1	7.5	13.1	30.0	46.4	26.1	176.0	65.0	92.7	72.4	63.9	59.1
11 2 Kimber (K-141)	3.1 4.6	7.1	1.6	14.7	42.5	41.0	25.8	170.0	57.7	74.0	65.6	58.6	59.4
12 2 Stone (H-56)	3.0 1 4.5	7.1	1.4	15.7	39.0	43.8	25.8	171.5	67.0	70.1	70.2	66.7	67.7
13 2 Hy-Line (934-E)	3.0 7 4.1	0.1	1.3	8.9	28.6	62.0	27.3	178.5	58.9	77.7	71.9	68.5	67.2
14 2 Ideal (236)	3.1 4.6	7.1	7.9	10.4	39.7	49.0	26.0	180.0	60.5	79.2	74.4	72.5	71.8
15 2 Babcock (B-300)	3.1 4.5	0.4	2.0	15.2	35.6	46.8	25.9	160.0	60.5	80.5	73.2	65.8	65.9
16 2 Hy-Line (934)	2.9 4.1	0.2	1.5	12.4	31.6	54.0	26.6	177.5	60.6	77.7	74.3	70.5	69.3
17 2 Honegger (Layers)	3.3 4.7	0.2	1.5	12.1	41.9	44.3	25.9	172.5	65.3	82.1	74.5	68.8	67.2
18 2 Davis (RIR)	4.5 5.3	0.0	0.4	6.5	25.3	67.8	27.5	170.0	62.0	91.3	72.7	61.3	57.7
19 2 Sturtevant (Sx1k)	4.6 4.4	0.1	0.7	7.8	25.7	65.7	27.4	176.0	61.8	78.4	66.2	58.8	57.3
20 2 Parks (Keystone)	3.4 4.9	0.1	0.9	9.6	34.8	55.7	26.6	175.5	61.0	75.9	70.8	67.2	63.1

Table 9 - 4B - II - Birds, Mortality, Feed Use and Cost and Income Data

		No. of Birds		Mortality		Feed Consumed		Value per Pullet Housed	
Entry No.		At One Week		Days		Lbs.		Cents	
Type House	House	At Kind	At Kind	151-500 Days	1-150 Days	Per Lb.	Per Lb.	Total Cost	Value
		%	%	Days	Days	Per Day	Per Day	Feed Cost	Feed Value
1	2	92.	91.	86.	1.4	5.6	1.0	.3	.21
2	112.	100.	85.	1.7	15.0	38.7	16.3	23.5	2.43
3	2	93.	92.	68.	2.1	26.0	54.6	16.7	23.2
4	2	92.	90.	69.	2.1	23.4	56.4	18.3	26.4
5	2	96.	93.	77.	2.7	17.1	38.7	16.7	23.9
6	2	93.	88.	67.	5.5	24.2	61.6	18.8	24.4
7	2	103.	99.	89.	1.3	10.1	12.1	20.7	25.8
8	2	98.	92.	75.	6.0	18.5	47.7	17.1	23.7
9	2	89.	87.	69.	3.8	20.7	42.6	18.4	25.5
10	2	115.	100.	87.	2.3	13.7	24.5	16.1	24.1
11	2	106.	94.	68.	5.9	27.5	57.8	16.8	22.9
12	2	101.	95.	76.	4.6	20.7	45.4	17.1	24.5
13	2	106.	98.	78.	3.1	20.5	39.8	16.6	24.1
14	2	106.	98.	85.	3.0	13.2	26.8	17.3	24.9
15	2	113.	100.	85.	3.5	15.0	35.4	17.0	24.7
16	2	107.	99.	84.	0.6	15.2	32.9	16.1	24.7
17	2	106.	98.	95.	3.8	13.3	31.7	17.4	24.9
18	2	98.	93.	89.	3.4	4.5	10.9	21.6	26.1
19	2	95.	92.	83.	2.9	9.8	16.9	21.6	26.4
20	2	118.	99.	86.	4.4	13.1	23.5	18.2	25.2
Av. 2		102.	95.	87.	3.7	16.3	35.4	19.0	24.8
Av. 2		106.	98.	85.	3.0	13.2	26.8	17.3	24.9
Av. 2		106.	98.	85.	3.5	15.0	35.4	17.0	24.7
Av. 2		107.	99.	84.	0.6	15.2	32.9	16.1	24.7
Av. 2		106.	98.	95.	3.8	13.3	31.7	17.4	24.9
Av. 2		98.	93.	89.	3.4	4.5	10.9	21.6	26.1
Av. 2		95.	92.	83.	2.9	9.8	16.9	21.6	26.4
Av. 2		118.	99.	86.	4.4	13.1	23.5	18.2	25.2

.36 0.79 3.70 4.86 5.97 .27 1.373

Table 9 - 4B - III - Egg Quality Data

Entry No.	Type	Housing	% Inclusion (break-out)	Candled Quality Percentages				Haugh Units				Shell Score (Specific Gravity)										
				% Loss (Down- grades)	Large Bloods	Small Bloods	Large Meats	Small Meats	A or Better	B	C	Chex & Cracks	Loss Egg	Sep.	Dec.	April	June	Average	October	January	April	July
1	2	2.0	0.6	1.5	7.9	22.6	94.5	2.2	0.1	2.3	0.0	84.1	79.8	73.9	70.2	76.9	2.32	2.45	1.26	1.41	1.36	
2	2	2.6	0.4	1.7	0.7	0.7	0.7	0.2	1.3	0.4	2.9	0.3	89.3	85.4	78.1	78.1	82.7	4.75	4.42	2.44	3.14	3.59
3	2	2.2	2.4	2.9	0.0	0.2	94.7	3.3	0.3	1.5	0.2	82.5	77.9	70.7	73.1	76.1	3.80	3.50	1.53	1.62	2.51	
4	2	3.1	1.0	1.2	0.1	0.3	84.3	1.5	1.0	3.8	0.4	84.0	80.1	69.3	73.5	76.8	3.72	3.78	2.25	1.92	2.92	
5	2	2.5	0.6	0.7	0.1	0.0	95.1	2.3	0.0	2.1	0.5	92.7	97.1	77.5	81.0	94.4	3.48	3.06	1.71	2.03	2.57	
6	2	2.2	0.8	1.9	0.7	0.1	96.0	1.7	0.2	3.0	0.2	86.0	79.3	75.9	77.2	79.6	3.64	3.23	1.43	1.59	2.47	
7	2	2.8	0.7	0.5	9.5	27.3	95.0	1.4	0.4	2.5	0.8	86.5	82.2	75.7	72.7	79.3	2.33	2.20	0.64	0.84	1.50	
8	2	3.0	2.3	1.4	0.2	0.5	84.0	1.9	0.1	3.6	0.3	86.0	81.6	75.1	74.0	79.2	4.12	4.03	2.60	2.45	3.15	
9	2	3.0	2.4	2.7	0.0	0.3	93.9	2.4	0.0	3.5	0.3	84.9	91.5	74.2	75.1	79.0	3.97	3.32	2.31	1.94	2.39	
10	2	2.7	1.3	0.4	0.1	0.3	94.2	1.9	0.5	3.3	0.0	89.3	82.9	73.1	73.4	81.1	4.08	4.18	2.80	2.58	3.41	
11	2	3.2	2.2	2.0	0.2	0.0	94.4	2.2	0.0	2.8	0.7	83.4	81.1	75.7	74.4	73.7	4.18	4.13	1.76	2.53	3.15	
12	2	2.8	0.6	0.8	0.0	0.0	93.9	3.3	0.1	3.5	0.1	85.9	81.7	77.3	76.1	80.2	3.74	3.35	1.90	2.15	2.78	
13	2	2.8	1.9	0.9	0.0	0.3	94.5	2.1	0.2	2.9	0.3	83.9	76.5	72.6	70.9	75.9	4.26	4.09	2.31	2.44	3.27	
14	2	2.4	1.4	1.8	0.0	0.7	96.0	3.6	0.0	2.7	0.6	84.1	77.8	73.5	67.3	75.7	4.01	4.32	1.75	2.85	3.23	
15	2	4.3	2.9	1.8	0.0	0.4	92.8	2.2	0.0	3.3	1.7	82.5	79.7	70.0	74.4	76.6	3.81	3.57	1.76	1.96	2.78	
16	2	2.1	1.3	0.0	0.4	95.9	1.3	0.1	3.3	0.4	81.5	77.0	73.9	73.0	76.6	3.53	3.50	2.61	1.62	2.92		
17	2	3.0	1.4	0.9	0.0	0.1	94.0	2.0	0.2	3.4	0.4	84.6	83.3	74.9	74.0	79.2	3.87	3.89	1.87	2.60	3.16	
18	2	4.1	0.4	1.4	7.1	20.1	91.3	3.0	0.4	4.3	0.5	85.1	80.8	68.5	69.7	75.0	2.79	1.56	0.81	0.98	1.36	
19	2	4.2	1.0	1.7	0.0	21.9	91.7	2.4	0.1	5.5	0.3	84.1	79.4	74.8	70.7	77.2	2.16	2.11	0.72	0.95	1.46	
20	2	2.0	3.1	0.1	0.8	94.6	2.2	0.1	2.7	0.4	86.4	82.5	77.2	73.9	80.0	4.07	3.91	2.40	2.72	3.27		
Av.2	2.9	1.4	1.5	1.7	4.8	94.3	2.0	0.2	3.0	0.5	85.3	87.9	74.1	73.8	78.6	3.60	3.43	1.81	2.01	2.71		

TABLE 9 - 4B - IV. CAUSES OF MORTALITY

Entry No.	Type Housing	Breeder	Mareks and Leukosis		Perito-nitis		Reprod. Disorders		Misc. and Unknown		No Autopsy		Total Mortality	
			8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days
1	2	Davis (Sex Link)	0.7	4.4	-	-	1.1	0.7	-	-	-	-	1.4	5.6
2	2	Kimber (K-137)	-	11.0	-	-	1.0	1.2	3.0	-	-	-	1.2	15.0
3	2	Welp's (937)	1.4	20.5	-	-	1.1	-	4.4	0.7	-	-	2.1	26.0
4	2	Shaver (*X 288)	0.7	13.3	-	-	2.2	1.4	6.7	-	1.1	-	2.1	23.4
5	2	Ind. Fm. Bu. (P.55)	0.7	13.9	-	-	-	1.4	3.2	0.7	-	-	2.7	17.1
6	2	Garber (GX 291)	1.3	18.1	-	1.0	1.2	1.4	3.8	2.8	-	-	5.5	24.2
7	2	Hubbard (Gold.Com)	0.6	6.1	0.7	-	1.0	-	3.0	-	-	-	1.3	10.1
8	2	Colonial (365-B)	2.7	16.3	-	1.1	-	2.0	1.1	1.3	-	-	6.0	18.5
9	2	Cashman (Hi-Cash)	-	13.8	-	1.2	-	3.0	4.5	0.7	1.2	3.8	20.7	
10	2	Heisdorf & N(Nick Ck)	1.1	7.0	-	-	1.0	-	4.0	1.1	1.0	2.3	13.0	
11	2	Kimber (K-141)	2.6	20.2	-	-	-	2.0	6.3	1.3	1.0	5.9	27.5	
12	2	Stone (H-56)	0.7	13.7	-	1.0	3.2	2.6	2.1	1.3	-	4.6	20.0	
13	2	Hy-Line (934-E)	1.3	12.3	-	1.0	-	1.2	5.2	0.6	2.0	3.1	20.5	
14	2	Ideal (236)	1.2	8.1	-	-	2.0	0.6	3.0	1.2	-	3.0	13.2	
15	2	Babcock (B-300)	1.2	11.0	-	-	1.0	1.2	1.0	1.2	2.0	3.5	15.0	
16	2	Hy-Line (934)	-	11.1	-	-	1.0	-	3.1	0.6	-	0.6	15.2	
17	2	Honegger (Layers)	-	8.2	-	-	-	1.3	5.2	2.6	-	3.8	13.3	
18	2	Davis (RIR)	-	3.3	-	-	1.2	2.7	-	0.7	-	3.4	4.5	
19	2	Sturtevant (Sx Lk)	-	1.1	-	-	-	3.3	-	5.5	2.8	-	2.8	9.8
20	2	Parks (Keystone B-1)	1.1	8.0	-	1.0	2.0	2.2	2.0	1.1	-	4.4	13.1	
2	Average		0.9	11.1	-	0.3	1.1	1.2	3.4	1.0	3.4	3.2	16.3	

Table 9 - 4C - I - Bird Weight, Egg Size, Maturity and Production Data

Entry No.	Housing	Breeder	Average		Egg Production Rate																
			Body Wt.	Egg Size Distribution (%)	Wt.	50% at Production	Wt.	50% at Production	Wt.	50% After Production	Eggs Pullet Housed										
			150 Days	500 Days	Pee Whee	Sma	Med	Large	Lg.	Ex. and Over	Av. oz./doz.	Age at Production	151 Days	240	330	420	500	500	50% After Production		
1 3 Davis (Sex Lk.)		4.7	6.0	3.0	0.1	10.7	6.0	6	20.3	72.0	4	28.1	174.0	57.4	66.0	58.7	55.0	53.0	62.0	201.4	
2 3 Kimber (K-137)		3.1	4.0	2	0.2	1.8	14.0	0	35.9	48.0	1	26.0	172.0	61.0	69.9	65.1	57.3	57.3	66.4	192.1	
3 3 Welp's (937)		3.0	4.1	0.2	1.3	9.4	30.6	59.5	26.9	177.5	54.7	67.5	61.8	58.4	57.5	64.4	174.3				
4 3 Shaver (*X288)		3.0	4.0	0.2	1.0	7.3	25.3	66.4	27.3	171.5	65.0	2	80.8	75.2	67.5	70.0	75.0	70.0	720.7		
5 3 Ind.Fm.Bu. (P.55)		3.0	2	4.0	0.1	1.2	8.1	25.7	65.0	27.2	173.7	59.9	73.7	64.8	60.8	60.8	63.6	196.3			
6 3 Garber (EX 291)		3.0	0	5.0	2	0.1	1.4	11.9	26.7	59.9	26.8	170.0	58.4	72.9	68.9	68.3	68.6	69.6	167.5		
7 3 Hubbard (Gld.Com.Y		4.0	2	5.0	0.0	0.5	4.3	15.0	8	79.4	28.9	173.0	58.4	69.3	58.9	50.1	46.4	62.5	177.6		
8 3 Colonial (365-B)		3.2	4.0	0.4	2.5	12.9	33.1	51.1	26.1	173.2	61.9	72.3	65.5	59.6	59.1	68.2	186.7				
9 3 Cashman (Hi-Cash)		3.4	4.0	0.0	0.9	0.5	28.0	8	60.0	26.0	0	182.0	54.0	8	72.0	68.1	65.0	65.0	70.4	200.0	
10 3 Heisdorf & N (NC)		2.9	4.0	2	0.0	1.0	10.3	37.7	51.0	26.5	179.5	55.5	78.5	72.8	63.8	65.1	72.6	195.5			
11 3 Kimber (K-141)		3.2	4.0	0.4	2.3	13.2	30.2	45.1	26.1	179.7	53.1	66.4	61.8	58.2	59.0	63.7	154.0				
12 3 Stone (H-56)		3.0	4.0	0.0	0.7	10.0	33.7	55.6	26.5	173.0	61.7	72.0	66.3	59.2	58.0	68.6	204.0				
13 3 Hy-Line (934-E)		3.0	3.0	0.1	0.5	5.0	21.4	73.0	27.9	175.5	58.5	75.0	68.1	62.0	61.9	70.4	206.0				
14 3 Ideal (236)		3.0	4.0	0.1	0.6	7.3	31.6	60.4	27.3	174.8	58.5	74.7	68.8	65.0	64.7	70.5	210.7				
15 3 Babcock (B-300)		3.0	4.0	0.2	1.7	11.0	29.9	57.2	26.7	167.2	64.0	73.3	69.5	64.8	65.0	70.1	199.0				
16 3 Hy-Line (934)		3.0	3.0	0.1	1.0	9.5	34.3	54.0	26.6	174.5	50.3	70.3	70.2	61.5	56.3	69.0	203.6				
17 3 Honegger (Layers)		3.0	4.0	0.3	1.2	8.4	31.0	59.1	26.9	172.0	61.7	72.0	66.7	61.2	61.1	68.7	188.0				
18 3 Davis (RIR)		4.0	5.0	0.0	0.5	5.6	27.7	66.1	27.6	179.5	55.9	59.7	53.2	52.3	64.0	197.5					
19 3 Sturtevant (SxLk)		4.0	6.0	0.1	0.6	7.9	24.8	66.7	27.6	175.7	57.5	63.2	58.9	55.7	54.5	62.1	192.6				
20 3 Parks (Keystone)		3.5	5.0	0.1	1.1	8.0	27.4	63.4	27.1	173.7	60.8	71.9	62.5	60.2	60.1	67.4	210.8				
21 3 Averages		3.0	4.0	0.1	1.1	9.0	29.0	60.7	27.1	174.6	58.9	71.8	65.6	60.5	59.0	67.8	194.1				

Table 9 - 4C - III - Birds. Mortality, Feed Use and Cost and Income Data

Entry No.	Type Housing	No. of Birds	Mortality	Feed Consumed	Value per Pullet Housed									
					Days 8-150	At End of Week	Days 151-500	Chick Price	Total Chick Feed Cost	Feed Cost per Egg	Value of Eggs	Value of Meat	Total Cost	Feed Cost per Day
1 3 97.	94.	87.	2.4	7.6 13.4 21.4	25.2	2.88	5.06	.34	0.94 4.02	5.31	5.48	.50	0.667	
2 3 117.	104.	82.	1.9	21.2 47.7	16.7	22.0	2.55	4.16	.37	0.73	3.15	4.26	.15	.20
3 3 97.	95.	70.	1.7	26.4 12.3	16.9	22.0	2.60	4.37	.37	0.74	2.07	4.11	.75	.19
4 3 95.	90.	73.	5.4	19.1 43.9	18.5	25.7	2.46	4.20	.34	0.84	3.65	4.85	.90	.25
5 3 99.	94.	69.	4.8	26.7 47.9	16.7	22.5	2.45	4.17	.39	0.74	3.22	4.38	.37	.20
6 3 102.	96.	58.	5.4	39.6 95.9	13.8	23.2	2.52	4.23	.32	0.84	2.79	3.98	.55	.22
7 3 112.	104.	79.	1.5	24.0 51.3	21.7	24.1	2.69	4.87	.35	0.90	3.41	4.67	.74	.37
8 3 103.	98.	69.	4.0	29.7 62.9	17.2	22.7	2.57	4.20	.39	0.77	3.09	4.27	.62	.18
9 3 90.	86.	72.	4.9	16.0 43.0	19.4	23.3	2.56	4.30	.36	0.92	3.39	4.59	.47	.26
10 3 120.	104.	80.	2.9	23.1 58.5	16.1	21.8	2.35	3.89	.31	0.71	3.00	4.03	.27	.19
11 3 103.	96.	61.	6.8	37.3 91.2	15.8	21.2	2.64	4.32	.37	0.75	2.62	3.76	4.11	.17
12 3 100.	94.	81.	5.7	13.6 35.4	17.5	22.7	2.53	4.19	.29	0.78	3.39	4.47	.56	.23
13 3 114.	104.	84.	2.4	17.2 37.3	17.1	22.5	2.35	4.09	.47	0.75	3.34	4.56	.55	.19
14 3 113.	104.	87.	3.6	15.3 33.7	17.0	23.3	2.46	4.20	.38	0.76	3.49	4.64	.76	.24
15 3 114.	104.	81.	4.9	22.1 55.9	17.1	22.2	2.36	3.94	.36	0.75	3.09	4.23	.38	.21
16 3 114.	104.	82.	1.8	21.7 39.6	15.6	21.9	2.43	4.04	.47	0.73	3.23	4.43	.50	.19
17 3 118.	102.	74.	3.9	27.3 63.1	17.9	23.7	2.58	4.33	.35	0.79	3.22	4.37	.01	.20
18 3 105.	102.	93.	2.7	8.0 20.4	21.7	24.2	2.81	4.84	.34	0.94	3.77	5.07	.30	.41
19 3 96.	92.	83.	3.8	9.8 22.5	22.0	24.9	2.95	5.08	.32	0.97	3.86	5.17	.22	.52
20 3 120.	104.	91.	4.6	12.5 20.5	17.9	24.3	2.69	4.55	.36	0.79	3.79	4.96	.72	.31
Av. 3 106.	99.	78.	3.9	21.1 47.3	19.1	23.2	2.57	4.35	.36	0.80	3.33	4.50	.26	0.993

Table 9 - 4D - III - Egg Quality Dataa

Entry No.	Housing	% Inclusion (break-out)		Candled Quality Percentages		Haugh Units		Shell Score (Specific Gravity)															
		Type	% Loss grades)	Large Bloods	Small Bloods	Large Meats	Small Meats	A on Bett er	B	C	Chex & Cracks	Loss Eggs	Sept.	Dec.	April	June	Average	October	January	April	July	Average	
1	0	3.5	1.3	2.1	2.0	24.7	93.2	2.0	0.1	3.0	0.6	0.7	94.3	87.1	76.1	71.0	77.9	3.07	1.47	1.26	2.27	1.99	3.03
2	0	3.3	1.1	2.3	1.1	20.3	93.0	1.3	0.2	4.2	0.4	0.4	88.8	85.1	79.5	78.9	83.0	5.01	4.99	3.21	3.04	4.06	3.05
3	0	2.9	2.7	2.7	1.2	1.6	94.3	2.6	0.2	2.2	0.7	84.0	79.3	74.6	73.9	78.0	4.11	4.20	2.30	1.78	3.12	1.91	
4	0	4.2	1.0	1.6	0.7	1.6	92.5	1.2	1.2	5.0	1.0	82.8	78.8	73.4	74.3	77.3	4.20	4.09	2.55	1.95	3.22	1.91	
5	0	3.3	0.7	1.3	0.1	0.4	93.5	2.0	0.1	3.8	0.6	91.2	86.6	79.9	79.7	84.4	4.17	3.72	2.34	1.99	3.03	1.91	
6	0	3.9	1.7	1.9	0.0	0.4	93.0	1.2	0.3	4.8	0.7	84.4	79.5	76.2	75.6	79.9	4.12	3.67	2.20	1.41	2.85	1.91	
7	0	4.9	0.7	1.9	1.6	30.5	91.9	1.5	0.4	4.4	1.8	86.2	82.1	76.6	73.6	79.6	2.65	2.56	1.72	0.91	1.41	1.91	
8	0	3.4	2.0	2.0	0.3	1.2	93.4	2.5	0.2	3.3	0.6	85.6	87.9	75.1	74.6	79.1	4.70	4.53	2.66	2.50	3.50	1.91	
9	0	3.0	2.2	2.7	0.0	0.4	94.1	1.8	0.2	3.3	0.6	85.0	82.7	75.6	74.3	79.4	4.57	4.17	2.61	1.93	3.12	1.91	
10	0	3.1	1.2	1.3	1.1	0.4	93.7	2.5	0.3	3.1	0.4	90.5	84.7	78.6	79.7	83.2	4.46	4.53	2.70	2.13	3.43	1.91	
11	0	2.9	2.6	2.9	1.1	0.3	93.1	2.7	0.1	2.9	1.2	84.8	80.8	76.4	73.6	78.9	4.73	4.63	2.81	2.26	3.61	1.91	
12	0	3.6	0.9	1.3	0.1	0.3	93.3	2.3	0.1	3.4	0.8	86.9	82.6	78.2	75.4	80.9	4.25	4.05	2.55	1.96	3.02	1.91	
13	0	4.4	1.5	1.6	0.1	0.6	91.2	3.7	0.2	4.2	0.7	82.1	76.9	72.9	69.9	75.4	4.78	4.50	2.72	1.81	3.45	1.91	
14	0	3.1	1.2	1.8	0.0	0.4	94.4	1.7	0.0	3.9	0.6	82.9	77.6	74.5	73.6	77.2	4.38	4.58	2.55	2.42	3.48	1.91	
15	0	5.0	2.8	1.8	0.2	0.3	90.9	1.9	0.1	5.8	1.2	87.5	79.0	73.4	73.3	77.1	4.12	3.80	2.31	1.66	2.93	1.91	
16	0	3.6	1.0	0.9	0.3	0.4	94.0	1.2	0.2	3.8	0.8	81.1	77.9	74.8	72.9	76.7	4.36	4.19	3.02	2.08	3.41	1.91	
17	0	4.3	1.5	2.0	0.0	1.0	91.9	2.5	0.3	4.4	0.9	85.2	82.6	76.3	74.1	79.5	4.23	4.036	2.79	2.09	3.37	1.91	
18	0	5.4	0.7	1.9	6.7	21.3	90.2	2.3	0.2	5.9	1.4	85.4	80.8	73.8	72.2	78.1	2.64	2.33	1.36	0.91	1.91	1.91	
19	0	4.2	0.9	2.1	10.6	22.9	92.1	1.7	0.3	5.3	0.7	84.9	80.4	75.0	73.3	78.6	2.73	2.63	1.29	0.97	1.91	1.91	
20	0	3.3	2.2	2.8	0.2	0.5	94.1	1.6	0.2	3.3	0.8	86.9	82.9	77.9	75.2	80.7	4.67	4.49	2.89	2.71	3.69	1.91	

TABLE 9 - 4D - IV. CAUSES OF MORTALITY

Entry No.	Type Housing	Breeder	Marks and Leukosis	Perito-nitis		Reprod. Disorders		Misc. and Unknown		No Autopsy		Total Mortality	
				8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days	8-150 Days	151-500 Days
				Days	Days	Days	Days	Days	Days	Days	Days	Days	Days
1 0	Davis (Sex Link)	1.7	5.8	-	0.4	1.1	0.3	2.5	0.4	-	2.4	9.8	
2 0	Kimber (K-1137)	0.9	12.1	-	0.3	1.6	0.6	4.3	0.3	-	1.8	18.4	
3 0	Welp's (937)	0.7	19.4	-	-	1.4	-	4.6	1.0	0.7	1.7	26.1	
4 0	Shaver (*X 288)	2.5	16.7	-	0.7	1.5	1.0	4.5	1.8	1.1	5.4	24.5	
5 0	Ind. Fm. Bu (P.55)	1.4	16.0	-	-	1.8	2.1	4.6	1.4	0.7	4.8	23.2	
6 0	Garber (GX 291)	2.7	19.8	-	0.7	1.8	0.7	4.8	2.1	1.1	5.4	28.2	
7 0	Hubbard (Gold. Com.)	0.6	9.8	0.3	-	1.6	0.3	4.9	0.3	0.3	1.5	16.7	
8 0	Colonial (365-B)	1.7	15.7	0.3	1.1	-	1.6	6.9	1.3	0.7	4.9	24.3	
9 0	Cashman (Hi-Cash)	0.7	18.4	-	0.4	-	1.9	3.9	2.2	0.4	4.8	23.1	
10 0	Heisdorf & N (Kn.Ck)	1.4	17.4	-	-	0.7	-	5.3	1.4	1.6	2.9	25.0	
11 0	Kimber (K-141)	2.7	24.7	-	0.7	1.8	1.7	4.3	2.4	0.7	6.8	32.2	
12 0	Stone (H-56)	1.7	14.2	-	1.0	1.4	2.3	1.4	1.7	-	5.7	18.0	
13 0	Hy-Line (934-E)	0.9	13.3	0.3	1.0	0.7	0.6	6.6	0.6	0.7	2.4	22.3	
14 0	Ideal (236)	1.8	8.3	-	0.3	1.3	0.3	5.2	1.5	-	3.6	15.2	
15 0	Babcock (B-300)	0.9	15.5	-	0.7	1.7	2.1	3.9	1.8	1.7	4.8	23.4	
16 0	Hy-Line (934)	0.3	11.8	-	0.6	0.7	0.9	5.3	0.6	0.3	1.8	18.8	
17 0	Honegger (Layers)	0.3	16.6	-	1.0	1.7	0.6	4.7	2.8	1.3	3.8	25.5	
18 0	Davis (RIR)	0.3	2.8	-	0.3	1.4	1.7	0.7	0.3	0.3	2.7	6.5	
19 0	Sturtevant (Sx Lk)	1.7	5.9	0.3	1.1	1.5	-	3.3	1.7	0.7	3.8	12.5	
20 0	Parks (Keystone B-1)	1.4	5.9	-	0.3	1.3	1.7	2.6	1.4	0.3	4.6	10.5	
0	Average		1.3	13.5	0.1	0.5	1.2	4.3	1.4	0.6	3.8	20.2	

Table 9 - 4C - III - Egg Quality Data

Entry No.	Type Housing % Loss grades)	% Inclusion (break-out)		Candled Quality Percentages		Haugh Units		Shell Score (Specific Gravity)													
		Large Bloods	Small Bloods	Large Meals	Small Meals	A or Beter	C	& Check Cracks	Loss Egg	Sept.	Dec.	April	June	Average	October	January	April	July	Average		
1	3	3.4	1.8	2.7	0.6	24.4	93.6	1.6	0.2	3.6	1.0	84.1	80.6	77.3	71.6	73.4	3.75	3.30	1.22	1.04	2.33
2	3	3.1	2.1	4.0	0.0	0.1	94.3	1.4	0.3	3.6	0.6	89.7	84.9	81.8	79.5	84.0	5.14	5.21	3.10	2.97	4.10
3	3	2.0	4.6	3.1	0.2	0.5	95.0	2.1	0.0	1.9	1.0	84.3	80.2	76.0	73.9	78.6	4.64	4.81	2.57	1.86	3.47
4	3	5.0	1.7	2.3	0.0	1.7	91.4	1.3	0.5	5.3	1.5	81.9	78.3	75.0	75.3	77.9	4.67	4.27	2.30	1.89	3.27
5	3	2.8	1.3	1.9	0.1	0.4	94.3	2.3	0.2	2.7	0.5	88.7	84.8	80.3	80.1	83.5	4.42	4.14	1.93	1.53	3.11
6	3	3.0	1.3	1.7	0.0	0.5	94.3	0.8	0.2	4.3	0.4	83.2	80.1	76.2	74.3	78.4	4.29	3.82	2.34	1.43	2.98
7	3	6.4	0.2	1.1	11.9	34.4	89.7	2.5	0.6	4.2	2.0	87.2	82.3	77.9	76.1	80.9	2.75	2.85	1.26	0.83	1.92
8	3	2.7	2.6	2.8	0.1	0.3	94.7	2.5	0.0	2.1	0.7	86.4	80.4	77.2	74.5	79.6	4.98	4.86	2.44	2.49	3.69
9	3	2.3	1.9	2.7	0.0	0.3	95.6	1.6	0.5	1.7	0.6	86.2	85.4	78.2	76.0	81.4	4.86	4.72	2.55	2.33	3.61
10	3	3.5	1.7	2.7	0.1	0.6	92.7	3.2	0.3	3.2	0.7	80.7	85.6	81.3	79.3	84.0	4.63	4.68	2.06	1.40	3.19
11	3	3.8	4.4	4.3	0.0	0.6	92.7	3.6	0.3	1.9	1.5	65.0	81.3	77.7	75.2	79.8	4.91	4.95	3.11	2.23	3.75
12	3	3.3	1.7	2.0	0.3	0.9	94.6	2.0	0.0	3.0	0.9	87.4	83.3	80.0	76.3	81.7	4.78	4.31	2.31	1.78	3.29
13	3	5.2	1.6	2.6	0.0	0.6	90.3	5.3	0.0	3.0	1.5	81.3	76.6	73.5	71.3	75.7	4.74	4.53	2.37	1.28	3.23
14	3	2.7	1.5	2.7	0.1	0.2	95.1	1.7	0.0	2.8	0.9	83.2	77.5	75.8	72.5	77.3	4.54	4.79	2.67	2.25	3.56
15	3	3.3	2.4	2.1	0.1	0.3	93.1	2.9	0.3	3.3	0.4	82.8	79.9	76.8	74.7	78.6	4.36	4.15	2.35	1.55	3.10
16	3	3.0	1.0	0.9	0.0	1.0	95.0	1.1	0.6	2.3	1.1	80.4	78.0	76.3	71.3	76.5	4.47	4.61	2.90	2.47	3.61
17	3	5.1	2.3	3.7	0.1	0.1	90.4	3.5	0.6	4.0	1.5	85.7	81.6	77.4	73.7	79.6	4.14	4.23	2.59	1.70	3.17
18	3	5.0	0.7	2.5	6.1	22.1	90.7	1.9	0.3	6.3	0.9	85.9	80.9	75.4	75.0	79.3	3.77	2.83	1.21	0.85	1.99
19	3	3.6	1.2	2.9	0.8	24.2	93.0	1.7	0.7	4.1	0.5	85.3	80.1	75.4	74.4	79.8	3.08	2.85	1.12	1.07	2.03
20	3	3.6	3.6	3.6	0.1	0.5	94.2	1.2	0.5	2.7	1.4	87.3	83.2	78.6	76.8	81.5	5.02	4.60	2.55	2.43	3.65
AV.3	3	2.7	2.0	2.7	1.9	5.7	93.2	2.2	0.3	3.3	1.0	85.3	81.2	77.5	75.1	79.8	4.36	4.23	2.25	1.76	3.15

TABLE 9 - 4C - IV. CAUSES OF MORTALITY
151-500 Days

Breeder	Mareks and Leukosis	Perito- nitis	Reprod. Disorders	Misc. and Unknown	No Autopsy	Total Mortality
1 3 Davis (Sex Link)	3.2	1.1	1.1	2.1	-	7.6
2 3 Kimber (K-137)	15.4	1.0	1.9	2.9	-	21.2
3 3 Welp's (937)	16.8	-	1.1	7.3	1.1	26.4
4 3 Shawer (*X 288)	10.3	1.0	1.1	5.5	1.1	19.1
5 3 Ind. Fm. Bu. (P.55)	13.9	-	3.2	9.6	-	26.7
6 3 Garber (GX 291)	27.0	1.0	2.1	6.3	3.2	39.6
7 3 Hubbard (Gold. Comet)	14.4	-	1.9	6.7	1.0	24.0
8 3 Colonial (365-B)	15.4	-	-	13.3	1.0	29.7
9 3 Cashman (Hi-Cash)	14.9	-	-	1.1	-	16.0
10 3 Heisdorf & N (Nick Ck.)	16.3	-	-	4.8	1.9	23.1
11 3 Kimber (K-141)	26.6	2.2	3.1	5.4	-	37.3
12 3 Stone (H-56)	10.5	2.1	-	1.0	-	13.6
13 3 Hy-Line (934-E)	9.6	1.0	1.0	7.7	-	19.2
14 3 Ideal (236)	6.7	-	1.9	7.7	-	16.3
15 3 Babcock (B-300)	15.4	1.0	1.0	3.8	1.0	22.1
16 3 Hy-Line (934)	14.4	1.9	-	4.8	-	21.2
17 3 Honegger (Layers)	17.5	1.0	3.0	3.8	2.0	27.3
18 3 Davis (RIR)	3.0	1.0	1.0	4.0	-	8.9
19 3 Sturtevant (Sx. Lk.)	5.4	2.2	1.1	1.0	-	9.8
20 3 Parks (Keystone B-1)	6.7	-	1.9	2.9	1.0	12.5
3 Average	13.2	0.8	1.3	5.1	0.7	21.1

Table 9 - 4D - I - Bird Weight, Egg Size, Maturity and Production Data

Entry No.	Type	Housing	Days	Average			Egg Size Distribution (%)			Egg Production Rate										
				Breeder	Body Wt.	and	Pee	Wee	Small	Medium	Large	Lg.	Ex. Over	Av. Egg oz/doz.	Age at 50% Production	151-240 Days	241-330 Days	331-420 Days	421-500 Days	471-500 Days
1	0	Davis (Sex Lk.)	4.0	7	6.0	0.1	0.5	6.0	20.0	73.4	28.0	178.4	56.3	71.9	62.5	58.3	55.7	66.1	207.1	
2	0	Kimber (K-137)	3.0	1	4.0	0.2	1.7	15.4	40.3	42.3	25.8	173.7	62.3	73.7	70.9	61.4	59.7	70.5	208.1	
3	0	Welp's (937)	2.0	1	4.1	0.2	1.2	11.2	35.6	51.8	26.4	176.3	56.0	72.4	66.7	60.4	58.9	67.8	194.3	
4	0	Shaver (*X288)	3.0	5	4.0	0.1	0.8	7.0	25.3	66.8	27.3	173.5	63.2	83.2	77.9	71.5	71.0	77.7	212.1	
5	0	Ind.Fm.Bu. (P.55)	3.0	1	4.0	0.1	0.9	7.4	31.6	57.9	26.8	177.4	56.8	75.9	68.0	64.2	62.9	70.6	200.1	
6	0	Garber (GX 291)	3.0	0	5.0	0.2	1.2	12.5	30.2	56.0	26.7	173.7	58.7	72.9	67.0	60.5	57.3	67.0	191.9	
7	0	Hubbard (Gld.Com)	4.0	2	5.0	0.0	0.5	5.2	18.2	76.0	28.4	173.7	61.2	73.4	62.2	53.2	49.3	66.0	202.1	
8	0	Colonial (365-B)	3.0	2	4.0	0.4	2.3	13.9	34.1	49.3	26.1	172.9	62.0	72.8	67.5	60.8	59.3	69.0	194.3	
9	0	Cashman (Hi-Cash)	3.0	4	4.0	0.0	0.7	10.0	33.5	55.7	26.6	181.3	53.4	77.3	72.0	67.8	65.1	72.7	198.0	
10	0	Heisdorf & N (NC)	3.0	0	4.0	0.1	0.9	11.6	37.5	49.9	26.4	178.2	57.1	70.2	70.4	63.3	60.9	72.3	195.5	
11	0	Kimber (K-141)	3.0	2	4.0	0.2	1.7	12.8	40.3	45.0	26.1	181.4	53.4	70.5	63.3	60.2	59.8	66.3	170.7	
12	0	Stone (H-56)	3.0	2	4.0	0.1	1.1	12.7	37.1	49.0	26.2	171.0	64.0	76.4	69.2	64.6	63.9	72.1	209.3	
13	0	Hy-Line (934-E)	3.0	1	3.0	0.1	0.4	6.3	22.7	70.6	27.8	176.9	56.6	75.1	67.8	64.7	62.2	70.5	200.5	
14	0	Ideal (236)	3.0	2	4.0	0.1	0.9	9.7	35.8	53.6	26.6	176.8	58.0	74.3	68.6	66.6	65.0	70.7	212.5	
15	0	Babcock (B-300)	3.0	2	4.0	0.4	1.8	12.5	32.0	53.3	26.4	167.6	66.1	75.6	70.2	65.5	64.3	71.5	205.5	
16	0	Hy-Line (934)	3.0	0	4.0	0.1	1.0	9.4	28.9	60.5	27.0	177.3	57.8	73.7	70.5	66.7	63.6	71.4	209.1	
17	0	Honegger (Layers)	3.0	3	4.0	0.3	1.3	10.3	36.7	51.4	26.4	173.0	61.8	76.4	70.5	66.6	66.7	72.0	196.4	
18	0	Davis (RIR)	4.0	5	5.0	0.0	0.5	5.4	27.2	66.9	27.5	184.5	53.3	72.9	63.8	55.8	52.7	66.3	207.0	
19	0	Sturtevant (SxLk)	4.0	7	6.0	0.1	0.5	6.5	23.8	69.1	27.8	180.9	54.1	69.6	60.7	57.2	54.7	64.4	195.2	
20	0	Parks (Keystone)	3.0	5	4.0	0.1	1.0	8.6	31.0	59.2	26.9	173.9	61.3	74.8	67.2	63.0	59.5	70.3	220.6	
•		Averages	3.0	5	4.0	0.1	1.0	9.8	31.0	57.9	26.9	176.1	58.7	74.6	67.9	62.6	60.6	69.8	200.5	

Table 9 - 4D - II - Birds, mortality, Feed Use and Cost and Income Data

No. of Birds	Mortality	Feed Consumed		Value per Pullet Housed	
		At One Week Housed	At End Housed	Chick Price Per Lb.	Total Chick Feed Cost
1 0 284. 277.	250.	2.4 9.3 18.5	21.4 26.4	2.92 5.12	.34 0.94 4.15
2 0 340. 304.	248.	1.8 18.4 40.9	16.7 23.6	2.63 4.25	.37 0.73 3.46
3 0 287. 283.	209.	1.7 26.1 61.1	16.9 23.3	2.67 4.41	.37 0.74 3.20
4 0 278. 263.	199.	5.4 24.5 61.7	19.5 26.5	2.55 4.35	.34 0.94 3.62
5 0 292. 277.	213.	4.8 23.2 47.1	16.7 23.8	2.59 4.34	.39 0.74 3.41
6 0 291. 275.	197.	5.4 28.2 67.1	18.8 24.2	2.73 4.55	.32 0.84 3.25
7 0 329. 303.	252.	1.5 16.7 29.3	20.7 25.5	2.74 4.88	.35 0.90 3.88
8 0 373. 298.	218.	4.9 24.3 55.3	17.2 23.9	2.67 4.37	.39 0.77 3.33
9 0 269. 257.	198.	4.8 23.1 55.3	18.4 25.2	2.71 4.52	.36 0.82 3.50
10 0 351. 304.	278.	2.9 25.0 60.4	15.1 23.4	2.55 4.27	.31 0.71 3.21
11 0 298. 278.	189.	6.8 32.2 73.2	15.8 21.3	2.73 4.46	.37 0.75 3.00
12 0 300. 282.	231.	5.7 18.7 45.9	17.5 24.6	2.63 4.30	.29 0.78 3.53
13 0 333. 302.	235.	2.4 22.3 45.9	17.1 24.5	2.57 4.48	.47 0.75 3.51
14 0 328. 302.	256.	3.6 15.2 31.7	17.0 24.5	2.66 4.43	.38 0.76 3.69
15 0 337. 304.	233.	4.8 23.4 54.8	17.1 24.3	2.55 4.21	.36 0.75 3.39
16 0 334. 303.	246.	1.8 18.8 39.7	15.6 24.2	2.58 4.34	.47 0.73 3.57
17 0 317. 299.	223.	3.8 25.3 64.0	17.8 24.7	2.62 4.33	.35 0.79 3.34
18 0 336. 295.	376.	7.7 6.5 13.9	21.7 25.2	2.88 4.95	.34 0.94 4.01
19 0 286. 274.	247.	3.8 12.4 27.3	22.0 26.2	3.02 5.24	.32 0.97 4.00
20 0 348. 303.	271.	4.6 10.5 19.1	17.9 25.5	2.74 4.60	.36 0.79 4.00

TABLE 9 - 4D - V. DUNCAN RANGE TEST AND RANGE GROUPS

Range	En- try	Eggs Per Pullet Housed	Duncan Test	Range	En- try	% Prod. After 50%	Duncan Test	Range	En- try	Feed per Lb. Eggs Test	Duncan	Days Lost to Mortal- ity	Duncan Test	
1	20	220.6		1	4	77.7		1	4	2.55		1	18	13.9
1	14	212.5		2	9	72.7		1	10	2.55		1	1	18.5
1	4	212.1		2	10	72.3		1	15	2.55		1	20	19.1
2	16	209.1		2	12	72.1		1	13	2.57		1	19	27.3
2	12	208.3		2	17	72.0		1	16	2.58		1	7	29.3
2	2	208.1		2	15	71.5		1	5	2.59		2	14	31.7
2	1	207.1		2	16	71.4		1	17	2.62		2	16	38.0
2	18	207.0		2	14	70.7		2	12	2.63		2	2	40.9
2	15	205.5		2	5	70.6		2	2	2.63		3	12	45.9
2	7	202.1		2	13	70.5		2	14	2.66		3	13	45.9
2	13	200.5		2	2	70.5		2	3	2.67		3	5	47.1
3	5	200.1		2	20	70.3		2	8	2.67		3	15	54.8
3	9	198.0		3	8	68.9		3	9	2.71		3	8	55.3
3	17	196.4		3	6	67.9		3	6	2.73		3	9	55.3
3	10	195.5		3	3	67.8		3	11	2.73		4	10	60.4
3	19	195.2		4	18	66.3		3	20	2.74		4	3	61.1
3	8	194.3		4	11	66.3		3	7	2.74		4	4	61.7
4	3	184.3		4	1	66.1		3	18	2.88		4	17	64.0
4	6	181.9		4	7	66.0		4	1	2.92		4	6	67.1
4	11	170.7		4	19	64.4		4	19	3.02		4	11	73.2