

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 16, 1976

I am enclosing the final summary of the Seventeenth 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 and management systems. Additional useful data on most of these stocks is published in the reports of other laying tests and in ARS-NE-21-3, a two-year combined summary of random sample laying tests in the United States and Canada. Please circulate this report among your associates in order that maximum use of it may be made. If additional copies are needed, they may be obtained from the address below.

In preparing the progress report to 420 days part of the feed consumed by each replicate was inadvertently omitted. Table 17-3X reports the corrected feed consumption and utilization data to replace the data in the 420-day report. Please accept our apology for this inconvenience.

The North Carolina Test continues its policy of acquiring those commercial stocks experiencing major distribution in this area. Category I-A identifies stocks voluntarily entered with full cooperation with financial support by the breeder or distributor (I-A-DIST.) and I-C identifies stocks acquired without approval and cooperation of the breeder or distributor. All other available facilities were utilized for management research. We express our appreciation to Babcock Poultry Farm, Inc., DeKalb AgResearch, Inc., Central Carolina Farmers, Inc., Hubbard Farms, Inc. and their distributors for providing extra hatching eggs to be used in this research.

Requests for reports from this test should be sent to Mr. T. R. Burleson, Jr., PIEDMONT RESEARCH STATION, ROUTE 6, BOX 420, SALISBURY, NORTH CAROLINA 28144.

Very truly yours,

Grady A. Martin

GRADY A. MARTIN
Extension Poultry Specialist



FINAL SUMMARY REPORT
SEVENTEENTH NORTH CAROLINA RANDOM SAMPLE LAYING TEST
March 28, 1975 through August 8, 1976

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

Data are presented as Tables 17-4A-I, II, III and IV, 17-4B-I, II, III and IV, 17-4C-I, II, III and IV, and 17-4D-I, II, III, IV, V and VI. Tables carrying the letters A, B, C and D in their numbers contain performance data for birds housed in 7-bird cages, on combination of litter and slats, in 2-bird 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 NE-21 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

Chicks for each entry were hatched at the test site from a 1080-egg sample which was taken by public employees in agriculture for each cooperating entry. The sample was taken as the eggs were gathered at a randomly chosen supply flock, except when nest sampling was not feasible. A maximum of 360 sexed pullets were divided into six equal lots. Two lots were reared on litter over concrete floors at 1.5 sq. ft. per pullet, and the other four lots were reared in randomly assigned blocks of seven 24-inch x 20-inch cages with 8 or 9 pullets per cage. First week mortality, sexing errors and accidental deaths were not charged against the entry.

All birds were vaccinated at day-old for Marek's. Keenum, Inc., Raleigh, North Carolina, provided the herpes virus of turkeys grown in duck cells. We express our appreciation to this organization and its personnel. No Marek's mortality was observed during the growing period.

All birds were debeaked at seven days; vaccinated by ocular route for Newcastle (LaSota) and bronchitis at one day and with LaSota Newcastle at four weeks; vaccinated for Pox via wing-web at nine weeks; vaccinated for Avian encephalomyelitis at 12 weeks; and vaccinated with LaSota Newcastle and bronchitis at 17 weeks. Birds exposed to litter were given 6-species coccidiosis vaccine at five days. Newcastle vaccine was boosted at 90-day intervals during the laying period. Pullets to be housed in 7-bird cages had the terminal segment of the center and inside toes removed, bilaterally, at 1-day old.

At 150 days of age, a maximum of 50 randomly chosen pullets were retained in the half slat-half litter pens where they were grown at about 1.7 sq. ft. per pullet, a maximum of 50 randomly chosen pullets from each of two lots of cage-grown pullets were retained in the cage blocks where they were grown with seven pullets per 24-inch x 20-inch cage, and a maximum of 52 randomly chosen pullets from each of the other two cage-grown lots were assigned to a block of 10-inch x 18-inch cages in another house at two birds per cage.

Commercial all-mash rations were purchased on contract. Starting mash (20% protein) was fed at the rate of 2.5 lbs. per bird and growing mash (16% protein) was fed ad lib until housing at 150 days. During the laying period either 20%, 18%, 16%, or 15% all-mash layer ration was fed, dependent upon average production rate and feed consumption of the white or brown egg birds in the particular house. Other management was as nearly commercial procedures as practical.

Many producers believe that cracks detected by candling eggs at the test site and specific gravity scores do not provide an adequate indicator of how eggs will grade out when shipped to a processing plant. In this test all eggs from each stock were accumulated during the 59th and 69th weeks and shipped to the FCX egg processing plant at Charlotte. These data are in Table 17-4D-V. We express our gratitude to Mr. Jim Arneson and FCX for this service.

RESULTS

Part I of Tables

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

Type Housing: 1 = 7-bird cages, 2 = slats and litter, 3 = 2-bird 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 Body 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 23 but less than 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 the 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 in the growing period, 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 1973, 1974, and 1975.

Values per Pullet Housed are the dollar amounts charged and credited to the entry at 3-year monthly average feed prices quoted by North Carolina Department of Agriculture, at 3-year weekly average egg prices quoted for Raleigh market by the Federal-State Market Service, and adjusted to farm price, and 3-year average fowl prices in North Carolina 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 the same as above.

% Loss (Downgrades) was the percentage by which total egg value was reduced below Grade A value due to downgrades detected by candling. We express our appreciation to the personnel of the North Carolina Department of Agriculture who provided candling service on one day of production each month. Market values of all eggs were calculated on the basis of these candling reports, with no discount for stained or dirty eggs.

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

Candled Quality Percentages: Official egg graders from the North Carolina 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 a 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 group of birds was classified in the months indicated.

Part IV of Tables

Entry No. and Type Housing 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 a North Carolina Department of Agriculture Diagnostic Laboratory once each week. We express our appreciation to Dr. W. W. Clemmons for providing this service to the test. The 10-point classification system recommended by the Council of American Official Poultry Tests was used on autopsy reports. Some categories which accounted for little mortality were combined under "All Other" in the interest of saving space. Since lesions of Marek's and Lymphoid Leukosis can be distinguished only by histological studies in some individuals, such cases are listed under "Marek's or Lymphoid Leukosis".

Part V of Tables

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

Commercial Egg Gradeout was made by stocks during the weeks indicated at the FCX plant at Charlotte, N. C. % A and % B are consumer grades. % Breaker combines C quality, small B quality, small inclusions, and stains which constitute breaker stock with sound shells. % Crax are non-leakers with unsound shells removed for breaker stock. % Farm Loss is the percentage of unsound eggs removed before shipping and % Other Loss includes all other eggs shipped (large spots, addled eggs, leakers, lost in machines, etc). Seasonal data are not combined.

Part VI 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 above the mean by 1, those between this point and the mean by 2, those in the least desirable half of the range below the mean 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.

Entries spanned by the same vertical line in the Duncan Test column have a greater than 5% probability that the indicated difference is due to sampling variation.

TABLE 17-3X

Corrected Feed Data for Progress Report to 420 Days

No. Entry	Breeder	A = 7-Bird Cages			B = Slat-Litter Pens			C = 2-Bird Cages			D = Average Performance of Entry		
		Feed Per Doz. Eggs	Feed Per Lb. of Eggs	Feed Per Days	Feed Per Doz. Eggs	Feed Per Lb. of Eggs	Feed Per Days	Feed Per Doz. Eggs	Feed Per Lb. of Eggs	Feed Per Days	Feed Per Doz. Eggs	Feed Per Lb. of Eggs	Feed Per Days
1	DeKalb (231)	3.82	2.39	25.08	3.70	2.28	25.90	3.84	2.36	25.17	3.79	2.35	25.38
2	Hy-Line (W-36)	3.85	2.39	23.40	3.58	2.21	24.23	3.87	2.37	23.97	3.76	2.32	23.87
3	Shaver (288)	3.91	2.39	25.06	3.63	2.23	25.51	3.84	2.30	24.89	3.79	2.30	25.15
4	Babcock (B-300)	3.88	2.45	24.14	3.86	2.43	25.66	3.89	2.39	24.60	3.88	2.42	24.80
5	Babcock (B-380)	4.70	2.78	26.15	4.08	2.45	26.53	4.43	2.63	26.58	4.40	2.62	26.42
6	DeK-Kimber (K-137)	4.12	2.56	25.02	3.96	2.48	25.36	4.09	2.52	24.55	4.05	2.52	24.98
7	Hubbard (Gld. Comet)	4.19	2.50	25.38	3.96	2.33	26.74	4.17	2.45	25.50	4.11	2.43	25.87
8	H&N ("Nick Chick")	4.05	2.61	23.80	3.81	2.44	24.28	4.21	2.51	23.84	3.96	2.52	23.97
9	Davis (Combiner)	5.04	2.95	27.11	4.85	2.78	27.30	5.25	3.06	28.12	4.95	2.93	27.51
10	Euribrid (Hisex White)	3.77	2.37	25.22	3.72	2.33	26.03	3.81	2.35	24.83	3.77	2.35	25.36
	Average	4.13	2.54	25.04	3.89	2.40	25.75	4.14	2.49	25.20	4.05	2.48	25.33

Table 17-4A-I - Body Weight, Egg Size, Maturity and Production Rate

Entry No.	Type	Housing	Breeder	Average Body Weight	% Egg Size, Distribution					Average Egg Wt. Oz./Doz.	Egg Production Rate - %								
					150 Days	500 Days	Pee	Wee	Small		151-240 Days	241-330 Days	331-420 Days	421-500 Days	471-500 Days				
															Eggs Per Pullet Housed				
1	1	DeKalb	(231)	2.8	3.8	0.1	2.1	12.8	31.8	53.2	25.8	170.0	67.5	83.3	77.5	61.1	55.8	76.1	237.6
2	1	Hy-Line	(W-36)	2.8	3.7	0.1	1.8	11.7	25.5	60.9	26.3	177.0	61.1	81.0	73.4	66.3	63.2	74.8	230.7
3	1	Shaver	(288)	3.1	3.9	0.0	1.6	10.6	27.2	60.5	26.4	171.0	67.7	80.5	76.0	60.2	53.9	74.4	236.7
4	1	Babcock	(B-300)	2.9	4.0	0.2	3.2	13.4	30.6	52.6	25.7	166.5	69.3	77.5	71.1	68.3	64.4	73.8	234.3
5	1	Babcock	(B-380)	3.4	4.2	0.0	0.4	6.1	20.5	72.9	27.4	190.5	48.2	76.5	70.0	58.6	51.9	70.1	206.7
6	1	DeK-Kimber	(K-137)	2.9	3.8	0.1	1.8	11.3	30.0	56.8	26.1	176.0	61.0	79.1	76.5	64.1	59.3	74.9	198.0
7	1	Hubbard	(Gld.Comet)	3.6	4.5	0.0	2.1	12.1	17.8	67.9	27.1	173.5	64.7	77.7	67.1	63.8	56.1	73.6	165.8
8	1	H&N ("Nick Chick")	2.8	3.6	0.0	3.0	16.7	36.8	43.5	25.2	172.5	66.9	76.6	66.7	58.9	56.4	70.8	223.8	
9	1	Davis (Combiner)	4.0	5.3	0.0	0.8	7.7	17.7	73.8	27.7	182.5	53.1	72.1	62.3	55.5	52.4	65.8	207.2	
10	1.	Euribrid	(Hisex White)	2.7	3.7	0.1	2.8	12.7	30.3	54.0	25.8	170.0	69.9	83.6	78.2	71.7	70.1	78.7	245.2
0	1	Average		3.1	4.0	0.1	2.0	11.5	26.8	59.6	26.4	175.0	62.9	78.8	71.9	62.8	58.4	73.3	218.6

Table 17-4A-II - Birds, Mortality, Feed Use, and Cost and Income Data

Entry No.	Type Housing	At One Week	Housed	At End of Test	Mortality	Feed Consumed	Value Per Pullet Housed											
							% 8-150 Days	% 151-500 Days	Av. Days Lost/Hen	Per Bird 1-150 Days	Per 100 Birds (One Day)	Per Dozen Eggs	Chick Price	Growing Feed Cost	Total Feed and Chick Cost	Value of Eggs	Value of Meat	IOPCC
1 1	111	100	83	0.0	17.0	23.9	15.1	21.3	2.40	3.89	0.35	1.13	5.85	7.32	10.70	0.25	3.62	
2 1	114	100	91	0.9	9.0	22.6	14.8	21.4	2.35	3.86	0.33	1.11	5.64	7.09	10.47	0.27	3.64	
3 1	105	100	84	3.8	15.0	19.4	15.7	21.2	2.40	3.96	0.32	1.17	5.94	7.45	10.62	0.26	3.42	
4 1	117	99	83	1.7	16.2	22.6	15.4	23.1	2.43	3.91	0.35	1.15	5.80	7.34	10.28	0.26	3.20	
5 1	120	100	81	1.7	18.0	23.6	16.6	24.6	2.78	4.77	0.35	1.26	6.23	7.84	9.46	0.27	1.88	
6 1	120	100	67	0.8	33.0	67.7	15.0	20.7	2.50	4.08	0.35	1.13	5.13	6.61	8.90	0.20	2.48	
7 1	120	100	43	0.0	57.0	109.8	16.4	22.7	2.48	4.20	0.31	1.24	4.43	5.97	7.75	0.15	1.92	
8 1	117	100	87	2.5	14.0	19.6	14.8	21.8	2.62	4.12	0.32	1.13	5.85	7.30	10.00	0.25	2.94	
9 1	108	100	90	6.4	10.0	10.6	18.7	25.4	2.96	5.13	0.34	1.46	6.72	8.55	9.48	0.40	1.33	
10 1	119	100	89	0.8	11.0	26.9	15.1	22.7	2.34	3.78	0.31	1.13	5.86	7.31	10.78	0.26	3.72	
AV 1	115	100	80	1.9	20.0	34.7	15.8	22.5	2.53	4.17	0.33	1.19	5.74	7.28	9.84	0.26	2.81	

Table 17-4A-III - Egg Quality Data

Table 17-4B-I - Body Weight, Egg Size, Maturity and Production Rate.

Entry No.	Type Housing	Breeder	Average Body Weight	% Egg Size, Distribution	Eggs Production Rate - %	
					Age at 50% Production	Age at 50% Production
1 2	DeKalb (231)	3.1	4.1	0.0 1.6 10.3 30.7 57.4	26.3 173.5 68.0 92.1 84.7	78.1 75.7 84.9 273.8
2 2	Hy-Line (W-36)	3.0	4.0	0.1 1.6 11.8 26.4 60.1	26.3 174.0 67.1 88.4 80.1	73.0 72.1 81.7 253.4
3 2	Shaver (288)	3.2	4.1	0.0 0.9 11.3 27.3 60.4	26.4 167.5 73.5 88.5 83.4	75.6 71.6 83.1 278.5
4 2	Babcock (B-300)	3.0	4.3	0.1 2.4 12.3 31.7 53.5	25.9 172.5 70.4 86.7 76.7	67.8 67.0 79.3 255.4
5 2	Babcock (B-380)	3.8	4.9	0.0 0.8 7.1 23.7 68.4	27.1 180.5 60.3 86.7 78.2	73.7 70.1 80.2 260.6
6 2	DeK-Kimber (K-137)	3.0	4.2	0.0 1.8 13.4 32.9 51.9	25.9 175.0 65.2 83.9 75.0	66.8 65.9 77.3 247.9
7 2	Hubbard (Gld. Comet)	3.8	4.6	0.0 0.9 9.7 21.3 68.2	27.6 171.0 71.7 84.8 75.2	65.9 60.8 78.1 253.5
8 2	H&N ("Nick Chick)	2.9	4.0	0.1 2.7 16.8 37.0 43.3	25.3 171.5 69.1 82.8 71.1	62.0 54.4 74.4 241.5
9 2	Davis (Combiner)	4.0	5.6	0.0 1.4 9.1 25.1 64.5	26.8 184.0 56.6 79.7 73.1	64.8 62.2 73.9 239.2
10 2	Euribrid (Hisex White)	3.0	3.9	0.1 3.1 13.9 30.6 52.3	25.9 163.5 79.2 87.3 87.3	62.7 58.5 78.6 266.2
0 2	Average	3.3	4.4	0.0 1.7 11.6 28.7 58.0	26.4 173.3 68.1 86.1 77.4	69.0 65.8 79.2 257.0

Table 17-4B-II - Birds, Mortality, Feed Use, and Cost and Income Data

Table 17-4B-III - Egg Quality Data

Entry No.	Type Housing	Loss % (Downgrades)	Large Meats		Small Meats		Candled Quality Percentages		Haugh Units		Shell Score (Specific Gravity)		
			A or Better	B or Better	C or Better	D or Better	Eggs	Cracks	June	July	August	September	December
1	2	2.4	0.6	1.1	0.1	0.2	95.0	1.2	0.2	3.4	0.2	82.8	76.3
2	2	1.2	0.1	0.4	0.0	1.3	97.3	0.5	0.0	1.9	0.2	81.6	70.3
3	2	3.2	0.7	1.2	0.3	1.0	93.6	0.9	0.2	4.7	0.6	80.9	73.0
4	2	3.7	0.4	0.6	0.1	0.9	92.5	3.4	0.8	2.7	0.6	84.0	72.6
5	2	2.6	1.0	1.8	9.2	10.0	95.3	0.6	0.3	3.0	0.8	84.0	74.5
6	2	2.3	1.0	0.8	0.2	0.7	94.9	2.3	0.2	2.4	0.2	87.2	80.4
7	2	1.9	1.6	2.1	16.4	14.2	96.3	0.5	0.1	2.6	0.5	82.0	72.6
8	2	1.4	1.1	1.3	0.5	0.2	96.8	0.6	0.0	2.6	0.0	86.7	73.2
9	2	1.8	2.4	3.7	12.2	10.1	96.9	0.0	0.0	2.7	0.4	82.3	73.8
10	2	4.9	0.5	1.2	0.1	0.8	90.8	1.9	0.2	5.6	1.4	79.8	73.3
AV 0	2	2.5	.9	1.4	3.9	3.9	94.9	1.2	0.2	3.2	0.5	83.1	74.0

Table 17-4C-I - Body Weight, Egg Size, Maturity and Production Rate.

Entry No.	Type Housing	Breeder	Average Body Weight	% Egg Size, Distribution				Average Egg Wt. Oz./Doz.	Eggs Production Rate - %									
				150 Days	500 Days	Pee Wee	Small		Medium	Large	Extra Large and Over	151-240 Days	241-330 Days	331-420 Days	421-500 Days	471-500 Days		
1 3	DeKalb (231)		2.9	3.8	0.1	1.4	10.6	29.2	58.7	26.2	174.5	67.2	83.5	79.1	69.3	67.3	78.8	250.2
2 3	Hy-Line (W-36)		2.9	3.9	0.1	1.5	11.4	25.5	61.5	26.5	175.5	64.4	81.3	73.8	67.5	65.5	76.0	231.6
3 3	Shaver (288)		3.0	4.0	0.0	1.1	9.2	21.9	67.8	27.0	169.0	71.1	83.1	80.3	72.5	69.2	80.0	256.7
4 3	Babcock (B-300)		2.9	4.0	0.1	2.4	10.8	24.6	62.1	26.4	170.0	68.6	79.7	75.2	69.5	67.1	76.3	249.8
5 3	Babcock (B-380)		3.6	4.4	0.0	0.9	7.0	20.2	71.9	27.0	180.0	59.3	80.4	73.7	63.4	62.3	74.6	240.9
6 3	Dek-Kimber (K-137)		3.0	4.0	0.1	1.6	11.1	29.5	57.8	26.1	171.0	66.8	78.2	70.7	64.4	63.0	73.5	228.2
7 3	Hubbard (Gld. Comet)		3.5	4.3	0.0	0.8	8.9	18.1	72.2	27.6	176.0	64.3	80.3	72.1	61.8	58.6	74.1	237.6
8 3	H&N ("Nick Chick")		2.8	3.4	0.0	2.3	13.4	32.0	52.3	25.9	169.0	68.0	76.8	69.8	63.8	61.9	72.6	238.1
9 3	Davis (Combiner)		3.7	5.3	0.0	0.6	5.5	18.5	75.4	27.6	186.5	50.4	74.5	68.1	58.3	55.4	68.6	215.7
10 3	Euribrid (Hisex White)		2.9	3.8	0.1	2.5	11.6	27.6	58.1	26.2	163.0	74.8	78.6	75.1	68.1	66.6	75.7	255.3
0 3	Average		3.1	4.1	0.0	1.5	10.1	24.7	63.8	26.6	173.4	65.5	79.6	73.8	65.9	63.7	75.0	240.4

Table 17-4C-II - Birds, Mortality, Feed Use, and Cost and Income Data

Entry No.	Type Housing	At One Week	Housed	At End of Test	% 8-150 Days	% 151-500 Days	Av. Days Lost/Hen	Days Housed	Mortality		Feed Consumed		Value Per Pullet Housed					
									Per Bird 1-150 Days	Per 100 Birds (One Day)	Per Pound of Eggs	Per Dozen Eggs	Growing Feed Cost	Total Feed and Chick Cost	Value of Eggs	Value of Meat		
1	3	113	104	96	3.5	7.7	15.8	15.4	22.8	2.36	3.86	0.35	1.16	61.2	7.64	11.22	0.27	3.851
2	3	119	104	92	2.5	11.5	27.5	15.0	22.0	2.34	3.88	0.33	1.14	5.70	7.17	10.50	0.27	3.594
3	3	113	104	97	3.6	6.7	15.8	15.3	23.3	2.28	3.84	0.32	1.14	6.25	7.73	11.40	0.29	3.968
4	3	118	104	100	1.7	3.8	9.4	15.2	23.2	2.37	3.92	0.35	1.15	6.20	7.70	11.03	0.30	3.636
5	3	120	100	97	1.7	3.0	2.8	16.5	24.3	2.64	4.47	0.35	1.25	6.80	8.41	10.86	0.33	2.783
6	3	110	104	86	0.9	17.3	25.6	16.5	22.4	2.52	4.10	0.35	1.24	5.94	7.53	10.40	0.26	3.132
7	3	118	104	97	5.9	6.7	10.1	16.7	22.5	2.44	4.21	0.31	1.31	6.34	7.98	10.81	0.32	3.145
8	3	121	104	98	1.7	5.8	9.1	15.3	21.5	2.48	4.02	0.32	1.16	6.06	7.55	10.61	0.25	3.304
9	3	120	104	97	4.2	6.7	7.3	16.9	25.1	3.03	5.23	0.34	1.31	7.15	8.81	9.81	0.42	1.408
10	3	115	104	98	0.0	5.8	6.7	15.4	21.3	2.32	3.80	0.31	1.15	6.13	7.59	11.49	0.28	4.185
AV		117	104	96	2.6	7.5	13.0	15.8	22.8	2.48	4.13	0.33	1.21	6.27	7.81	10.81	0.30	3.301

Table 17-4C-III - Egg Quality Data

% Inclusion (Break-Out)	Candled Quality Percentages	Haugh Units	Shell Score (Specific Gravity)																		
			Entry No.	Type Housing																	
	Loss % (Downgrades)		Large Bloods	Small Bloods																	
			Large Meats	Small Meats																	
			A or Better	B																	
			C Quality																		
			Chex and Cracks																		
			Loss Eggs																		
			October	January																	
			April	June																	
			Average	November																	
			February	May																	
			July	Average																	
1	3.4	0.8	1.1	0.6	1.0	92.7	1.4	0.1	5.7	0.1	85.9	80.6	75.4	73.6	78.9	3.15	2.95	1.67	1.48	2.31	
2	3	2.4	0.1	0.9	1.1	1.0	95.2	0.1	0.4	3.8	0.5	83.0	74.0	69.9	70.6	74.4	3.49	2.82	1.80	1.27	2.34
3	3	4.4	1.7	1.0	0.4	0.8	91.5	1.7	0.3	6.0	0.5	87.5	78.7	77.6	75.1	79.7	3.26	2.31	1.46	1.51	2.14
4	3	4.4	1.9	0.7	0.3	0.4	91.8	1.0	0.8	5.1	1.4	85.0	76.0	74.3	71.6	76.7	2.70	2.13	1.62	1.34	1.95
5	3	3.5	1.0	1.7	6.2	9.6	93.5	0.4	0.1	5.3	0.7	87.5	77.2	73.4	74.7	78.2	1.95	1.60	1.19	1.12	1.46
6	3	2.3	0.6	1.1	0.4	0.7	94.9	2.6	0.1	2.4	0.0	91.4	84.9	78.1	77.0	82.9	3.81	2.69	1.64	1.46	2.40
7	3	2.6	1.3	3.3	13.5	12.4	95.1	0.5	0.0	4.0	0.4	88.5	79.1	74.1	72.1	78.4	2.00	1.87	1.31	1.27	1.61
8	3	3.8	1.2	1.5	0.5	0.4	92.6	1.4	0.2	6.2	0.6	89.7	81.9	77.9	74.9	81.1	2.89	2.45	1.87	1.34	2.14
9	3	2.9	2.0	2.2	11.2	9.5	94.4	1.1	0.5	3.5	0.5	85.7	76.2	70.8	69.3	75.5	2.74	2.08	1.24	1.11	1.79
10	3	2.5	1.6	0.6	0.3	0.2	94.7	1.2	0.4	3.0	0.6	85.2	75.0	73.3	70.6	76.0	2.37	1.82	1.24	1.20	1.66
11	3	3.2	1.2	1.4	3.4	3.6	93.6	1.1	0.3	4.4	0.5	86.9	78.4	74.5	73.0	78.2	2.84	2.27	1.50	1.31	1.98

Table 17-4D-1 - Body Weight, Egg Size, Maturity and Production Rate

Entry No.	Type Housing	Average Body Weight	% Egg Size, Distribution	Eggs Production Rate - %								Fuller Eggs Per House					
				150 Days	500 Days	Fee Wee	Med. Egg	Large Egg	Extra Large and Over	Avg. Egg Wt.	Age at 50% Production	421-500 Days	471-500 Days	After 50% Production			
1 0	Dekalb (231)	3.0	3.9	0.1	1.7	11.2	30.5	56.4	26.1	172.7	67.6	86.3	80.4	69.5	66.3	79.9	253.9
2 0	Hy-Line (W-36)	2.9	3.9	0.1	1.7	11.6	25.8	60.8	26.4	175.5	64.2	83.6	75.8	69.0	66.9	77.5	238.6
3 0	Shaver (288)	3.1	4.0	0.0	1.2	10.4	25.5	62.9	26.6	169.2	70.8	84.0	79.9	69.5	64.9	79.1	257.3
4 0	Babcock (B-300)	2.9	4.1	0.1	2.7	12.2	29.0	56.1	26.0	169.7	69.4	81.3	74.3	68.5	66.2	76.5	246.5
5 0	Babcock (B-380)	3.6	4.5	0.0	0.7	6.7	21.5	71.1	27.2	183.7	55.9	81.2	27.0	65.3	61.4	74.9	236.1
6 0	DeK-Kimber (K-137)	2.9	4.0	0.1	1.7	12.0	30.8	55.5	26.0	174.0	64.3	80.4	74.1	65.1	62.7	75.2	224.7
7 0	Hubbard (Gld. Comet)	3.6	4.5	0.0	1.3	10.2	19.1	69.4	27.4	173.5	66.9	80.9	71.5	63.8	58.5	75.3	219.0
8 0	H&N ("Nick Chick)	2.8	3.7	0.0	2.7	15.6	35.3	46.4	25.5	171.0	68.0	78.7	69.2	61.6	57.6	72.6	234.5
9 0	Davis (Combiner)	3.9	5.4	0.0	0.9	7.4	20.4	71.2	27.4	184.3	53.4	75.4	67.8	59.6	56.6	69.5	220.7
10 0	Euribrid (Hisex White)	2.9	3.8	0.1	2.8	12.8	29.5	54.8	26.0	165.5	74.6	83.2	76.6	67.5	65.1	77.7	255.6
0 0	Average	3.2	4.2	0.1	1.7	11.0	26.7	60.5	26.5	173.9	65.5	81.5	74.4	65.9	62.6	75.8	238.7

Table 17-4D-II - Birds, Mortality, Feed Use, and Cost and Income Data

Table 17-4D-III - Egg Quality Data

Entry No.	Type Housing	Loss % (Downgrades)	% Inclusion (Break-Out)		Candled Quality Percentages		Haugh Units		Shell Score (Specific Gravity)												
			Large Bloods	Small Bloods	Large Meats	Small Meats	A or Better	C Quality	Cracks	Loss Eggs	June	May	February	November	Average	Average	Average				
1	0	3.0	0.5	1.1	0.3	1.0	93.8	1.3	0.2	4.4	0.3	83.5	79.7	77.4	74.4	78.7	3.58	2.71	1.52	1.49	2.33
2	0	1.9	0.1	0.5	0.5	1.3	96.0	0.3	0.1	3.2	0.4	80.9	74.1	70.5	70.2	73.9	3.21	2.71	1.65	1.31	2.22
3	0	3.7	0.9	1.2	0.2	0.9	92.3	1.4	0.2	5.5	0.5	82.1	76.9	76.1	72.8	77.0	3.51	2.49	1.40	1.45	2.21
4	0	4.3	1.0	0.8	0.2	0.8	91.8	2.0	0.6	4.3	1.2	85.3	75.1	74.4	72.1	76.7	3.37	2.43	1.54	1.31	2.16
5	0	2.9	0.8	1.9	7.3	9.6	94.3	0.4	0.1	4.6	0.6	85.5	77.1	74.0	73.3	77.5	2.36	1.91	1.19	1.13	1.65
6	0	2.8	0.8	1.2	0.2	0.9	94.3	1.8	0.2	3.2	0.4	88.4	82.8	80.4	77.5	82.3	3.76	2.88	1.70	1.64	2.50
7	0	2.2	1.4	2.5	13.3	13.7	95.9	0.3	0.1	3.1	0.5	84.2	75.6	73.0	72.9	76.4	2.29	1.87	1.33	1.30	1.70
8	0	2.9	1.1	1.4	0.6	0.4	94.1	1.1	0.1	4.3	0.4	87.5	78.4	78.7	75.8	80.1	3.18	2.61	1.78	1.50	2.27
9	0	2.4	1.8	3.2	10.6	10.5	95.4	0.5	0.3	3.5	0.3	83.0	76.3	74.4	71.5	76.3	2.71	2.01	1.23	1.15	1.77
10	0	4.0	1.1	0.9	0.3	0.7	92.2	1.2	0.3	5.2	1.1	81.5	75.7	74.3	71.9	75.8	3.04	2.38	1.40	1.26	2.02
AV	0	3.0	1.0	1.5	3.4	4.0	94.0	1.0	0.2	4.1	0.6	84.2	77.2	75.3	73.2	77.5	3.10	2.40	1.47	1.35	2.08

Table 17-4D-V - Commercial Gradeout*

Entry Number	Housing Type	59 Weeks Old - May						69 Weeks Old - July													
		Breaker			Crax			Loss			Breaker			Crax			Loss				
Breeder		A	%	B	%	C	%	Farm	%	Other	%	A	%	B	%	C	%	Farm	%	Other	%
1	0	DeKalb	(231)	82.1	3.1	10.1	1.1	1.1	2.5	80.6	0.4	5.1	9.1	0.7	4.1						
2	0	Hy-Line	(W-36)	86.1	2.9	6.9	0.8	1.1	2.2	84.2	0.4	3.2	6.6	1.3	4.2						
3	0	Shaver	(288)	82.9	3.8	8.6	0.6	0.6	0.9	3.1	77.0	0.3	6.4	9.4	2.7	4.2					
4	0	Babcock	(B-300)	73.3	11.8	7.9	1.3	1.2	4.5	77.8	0.2	4.7	9.1	3.1	5.0						
5	0	Babcock	(B-380)	86.6	1.1	6.7	0.8	2.3	2.6	80.2	0.7	1.2	7.2	2.3	8.4						
6	0	DeK-Kimber	(K-137)	83.8	5.5	6.5	1.1	1.4	1.7	81.2	0.8	5.8	6.9	1.1	4.2						
7	0	Hubbard	(Gld. Comet)	87.0	0.9	6.4	1.1	1.4	3.2	87.4	0.3	1.5	3.4	3.0	4.4						
8	0	H&N	("Nick Chick")	87.5	3.4	4.2	1.0	1.3	2.6	80.4	0.5	4.0	7.9	2.1	5.1						
9	0	Davis	(Combiner)	87.2	0.3	6.7	0.7	2.8	2.3	89.7	0.1	0.4	4.0	2.0	3.8						
10	0	Euribrid	(Hisex White)	79.5	6.7	8.2	0.7	2.0	2.9	78.4	0.2	5.9	9.8	3.2	2.6						
0	0	Average		83.6	4.0	7.2	0.9	1.6	2.8	81.7	0.4	3.8	7.3	2.2	4.6						

*NOTE: Commercial gradeout was omitted during the first two periods following retirement of the Processing Plant Manager. Coordination was re-established in time to obtain data for May and July.

Table 17-4D-VI - Duncan Range Test and Range Groups

En- Range	try	Eggs Per Pullet Housed	Duncan Test	En- Range	try	% Pro- duction		Duncan Test	En- Range	try	Feed Per Lb. of Eggs	Duncan Test	En- Range	try	Days Lost to Mor- tality	Duncan Test	
						After 50%	After 50%										
1	3	257.3		1	1	79.9		1	2	2.29		1	9	6.5			
1	10	255.6		1	3	79.1		1	3	2.29		1	5	9.3			
1	1	253.9		2	10	77.7		1	1	2.34		1	10	12.6			
2	4	246.5		2	2	77.5		1	10	2.35		2	3	12.9			
3	2	238.6		2	4	76.5		2	4	2.41		2	8	13.8			
3	5	236.1		3	7	75.3		2	7	2.42		2	4	14.8			
3	8	234.5		3	6	75.2		3	6	2.50		2	1	16.8			
4	6	224.7		3	5	74.9		3	8	2.52		3	2	24.0			
4	9	220.7		4	8	72.6		3	5	2.62		4	6	34.5			
4	7	219.0		4	9	69.5		4	9	2.91		4	7	43.8			
Average		238.7		Average		75.8		Average		2.46		Average		18.9			

TABLE 17-4A & B-IV -- CAUSES OF MORTALITY

Entry Number	Housing	Marek's or Lymphoid Leukosis	Marek's or Lymphoid Leukosis			Reproductive Disorders	Cannibalism	All Other	No Necropsy Report			Total				
			Gro.	Lay	Gro.				Gro.	Lay	Gro.	Gro.	Lay	Gro.		
<u>A*</u>																
1	1	-	-	-	-	-	2.0	13.0	-	1.0	-	1.0	-	0.0	17.0	
2	1	-	-	-	-	-	7.0	1.0	-	0.9	1.0	-	-	0.9	9.0	
3	1	-	-	-	-	-	2.0	10.0	-	1.0	2.9	2.0	0.9	-	3.8	
4	1	-	-	-	-	-	2.0	10.1	-	1.7	3.0	-	1.0	1.7	15.0	
5	1	-	-	-	-	-	16.0	-	2.0	1.7	-	-	-	1.7	16.2	
6	1	-	-	-	-	-	1.0	26.0	-	1.0	0.8	2.0	-	0.8	33.0	
7	1	-	-	-	-	-	-	54.0	-	2.0	-	1.0	-	0.0	57.0	
8	1	-	-	-	-	-	0.8	1.0	-	2.0	1.7	5.0	-	-	2.5	
9	1	-	-	-	-	-	1.0	8.0	-	3.6	1.0	1.9	-	6.4	14.0	
10	1	-	-	-	-	-	-	10.0	-	1.0	0.8	-	0.8	0.8	11.0	
AV	1	0.0	0.0	0.0	0.1	0.1	1.5	15.4	0.1	0.9	1.3	1.7	0.4	1.9	20.0	
<u>B</u>																
1	2	-	-	-	-	-	5.0	2.0	-	-	1.0	-	-	0.0	8.0	
2	2	-	-	-	-	-	4.9	1.0	-	1.8	4.0	-	-	1.8	9.9	
3	2	-	-	1.0	-	-	-	1.0	-	2.7	-	0.9	1.0	3.7	3.0	
4	2	-	-	-	-	-	1.0	4.0	-	1.6	1.0	-	1.0	1.6	7.0	
5	2	-	-	-	-	-	-	2.0	-	0.9	-	-	0.9	2.0	-	
6	2	-	-	-	-	-	5.0	-	1.0	-	2.0	0.9	-	0.9	8.0	
7	2	-	-	-	-	-	-	9.0	-	1.0	2.5	1.0	-	2.5	11.0	
8	2	-	-	1.0	-	-	3.0	1.0	-	3.4	3.0	-	1.0	3.4	9.0	
9	2	-	-	-	-	-	1.0	-	-	-	-	-	0.0	1.0	-	
10	2	-	-	-	-	-	3.0	-	-	2.0	-	-	0.0	5.0	-	
AV	2	0.0	0.1	0.0	0.1	0.0	1.5	2.8	0.0	0.2	1.3	1.4	0.2	0.3	1.5	6.4

* We obtained inadequate initial debeaking on this flock and experienced some mortality due to cannibalism. Touch-up debeaking was successful in stopping cannibalism. However, we believe that bruising with the beak was a major cause of the very high rate of reproductive disorders found at post-mortem examination in this flock. Fifty percent of the total mortality due to reproductive disorders came from three of the 20 replicates in this house.

TABLE 17-4C & D-IV -- CAUSES OF MORTALITY

Entry Number	Type Housing	Marek's	Lymphoid Leukosis	Marek's or Lymphoid Leukosis				Reproductive Disorders *	Cannibalism *	All Other			No Necropsy Report			Total
				Gro.	Lay	Gro.	Lay			Gro.	Lay	Gro.	Lay	Gro.	Lay	
		C	1	3	-	1.0	-	-	3.8	1.9	-	2.7	1.0	0.8	-	3.5
2	3	3	-	-	-	-	-	6.7	2.9	0.8	-	1.7	1.0	-	2.5	11.5
3	3	3	-	-	-	-	-	2.9	1.9	-	-	1.8	-	1.9	3.6	6.7
4	3	3	-	-	-	-	-	1.9	1.9	-	-	0.9	-	0.8	-	1.7
5	3	3	-	-	-	-	-	1.0	1.0	-	-	0.8	1.0	0.8	-	3.8
6	3	3	-	-	-	-	-	-	-	-	-	2.9	0.9	2.9	0.9	17.3
7	3	3	-	-	-	-	-	-	-	1.0	-	4.3	1.0	-	5.9	6.7
8	3	3	-	-	-	-	-	-	-	-	-	0.8	1.0	0.8	-	1.7
9	3	3	-	-	-	-	-	-	-	-	-	2.5	3.8	1.7	1.0	5.8
10	3	3	-	-	-	-	-	-	-	-	-	-	-	-	1.0	6.7
AV	3	0.0	0.1	0.0	0.1	0.0	0.0	1.7	3.4	0.2	0.0	1.6	1.2	0.8	0.7	2.6
																7.5
D*	1	0	-	0.3	-	-	-	3.6	5.6	-	0.3	0.9	1.0	0.3	-	1.2
2	0	-	-	-	-	-	-	6.2	1.6	0.3	-	1.4	2.0	-	0.3	10.1
3	0	-	0.3	-	-	0.3	-	1.6	4.3	-	0.3	2.5	0.7	1.2	3.7	8.2
4	0	-	-	-	-	-	-	1.6	5.3	-	-	1.4	1.3	0.3	0.7	9.0
5	0	-	-	-	-	-	-	0.3	6.3	-	0.7	1.1	0.3	0.3	-	7.7
6	0	-	-	-	-	-	-	-	-	0.7	13.9	-	0.7	0.3	2.3	0.6
7	0	-	-	-	-	-	-	-	22.9	0.6	1.0	2.3	1.0	-	-	19.4
8	0	-	-	-	-	0.3	1.3	3.9	-	0.7	2.0	3.0	0.3	0.3	2.5	24.9
9	0	-	-	-	-	0.3	-	3.3	0.3	-	2.0	1.6	1.2	0.3	3.5	9.6
10	0	-	-	-	-	-	-	-	5.9	-	-	1.0	0.3	0.3	0.3	5.9
AV	0	0.0	0.1	0.0	0.1	0.0	0.0	1.6	7.3	0.1	0.4	1.4	0.4	0.4	0.5	2.0
																11.3

* We obtained inadequate initial debeaking on this flock and experienced some mortality due to cannibalism. Touch-up debeaking was successful in stopping cannibalism. However, we believe that bruising with the beak was a major cause of the very high rate of reproductive disorders found at post-mortem examination in this flock. Fifty percent of the total mortality due to reproductive disorders came from three of the 20 replicates in House A.

SEVENTEENTH NORTH CAROLINA RANDOM SAMPLE POULTRY TEST

Breeder	Stock Identifi- cation	Entry Cate- gory*	Source of Sample
Babcock Poultry Farm, Inc. Box 280 Ithaca, NY 14850	Babcock B-300 WL INX	I-A YES	Babcock Poultry Farm, Inc. Box 280 Ithaca, NY 14850
Babcock Poultry Farms, Inc. Box 280 Ithaca, NY 14850	Babcock B-380 RIRxSYN IBX	I-A YES	Babcock Poultry Farm, Inc. Box 280 Ithaca, NY 14850
Joe K. Davis Hatchery Box 27 Earl, NC 28038	Combiner Sex Link RIRxBPR BX	I-A YES	Joe K. Davis Hatchery Box 27 Earl, NC 28038
DeKalb AgResearch, Inc. Sycamore Road DeKalb, IL 60115	DeKalb 231 IBX	I-A YES	Cornwell Farm Center Clinton, NC 28328
DeKalb AgResearch, Inc. Sycamore Road DeKalb, IL 60115	DeKalb-Kimber-K-137 WL 4wSX	I-A YES	Moyer Chicks Quakertown, PA 18951
Euribrid B.U. by Pilch, Inc. Box 438, Troutman, NC 28166	Hisex White WL 4wSX	I-A YES	River View Poultry Farm Route 2, Camellton, New Brunswick, CANADA
H&N, Inc., Entry by Owens Hatchery, Inc. Dahlonega, GA 30533	H&N "Nick Chick" WL 4wSX	I-A DIST.	Owens Hatchery, Inc. Dahlonega, GA 30533
Hubbard Farms, Inc. Walpole, NH 03608	Hubbard Golden Comet NHxSYN BX	I-A YES	Hubbard Farms, Inc. Statesville, NC 28677
Hy-Line International 1206 Mulberry Des Moines, IA 50309	Hy-Line W-36 INX	I-C NO	Not Applicable
Shaver Poultry Breeding Farms, Ltd. Box 400 Galt, Cambridge Ontario, NIR 5W6, CANADA	Starcross 288 WL SX	I-A YES	Delta Hatcheries Lake City, FL 32055

SEVENTEENTH TEST

* Category I is commercial stocks available in North Carolina and adjacent states in quantity. Sub-category A indicates full cooperation of the organization making the entry, including voluntary financial assistance to the test. Sub-category C indicates that the breeder preferred not to have the stock entered in this test but that sales in this area are sufficient to require its inclusion under current test policy.