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FIRST CYCLE REPORT OF THE THIRTY FIFTH

NORTH CAROLINA LAYER PERFORMANCE

AND MANAGEMENT TEST

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The North Carolina Layer Performance and Management Test is conducted under the auspices of the Cooperative Extension Service at North Carolina State University and the North Carolina Department of Agriculture and Consumer Services. The flock is maintained at the Piedmont Research Station, Salisbury, North Carolina. Mr. Joe Hampton is the Piedmont Research Station Superintendent; Mr. Aaron Sellers is Resident Manager of the flock; Pam Jenkins is the Statistical Research Assistant; and Dr. K. E. Anderson is Project Leader. The purpose of this program is to assist poultry industry personnel in North Carolina, across the country, and internationally in the evaluation of commercial layer stocks and management systems. The data presented herein represents the analysis of the rearing period for the 35th North Carolina Layer Performance and Management Test.

The data presented herein represents the analysis of the first production cycle and molt of the 35th North Carolina Layer Performance and Management Test. Performance summary tables are available for each strain, and molt treatment used as well as for the combined results.

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35th NORTH CAROLINA LAYER PERFORMANCE AND MANAGEMENT TEST
Protocol Procedures Used

Entries:

A total of seven white egg and three brown egg strains were accepted in accordance with the rules and regulations of the test.

Dates of Importance:

The eggs for the 35th NCLP&MT were set on December 18, 2002 at the North Carolina Dept. of Agriculture and Consumer Services, Piedmont Research Station, Poultry Unit at Salisbury, NC. The flock was hatched on January 8, 2003 and the pullets were moved to the laying facilities on April 30 to May 1, 2003 during their 17th week of age. The age of the flock at transfer was lowered to approximately 16 weeks due to current trends in the industry and requests of the breeders to move the flock prior to onset of egg production in the rearing houses.

First cycle production records commenced on May 7, 2003 (17 weeks of age), until molt was induced on April 14, 2004. The molt records commenced on April 14, 2004 (66 weeks of age), and ended on May 12, 2004 (70 weeks of age). This report includes production data summarized from 17 to 66 weeks, and 66 to 70 weeks. A table showing the changes in body weights from 17 to 66 wk of age and the weight loss during the molt period is included in the molt period information.

Pullet Housing:

The chicks were randomly assigned to the growing cages with white egg and brown egg replicates being intermingled throughout the house. The white egg strains occupied approximately 70 % of the house and brown egg strains occupied the other 30 % of the house. All strains were assigned to be represented as equally as possible in each of room, row, and levels.

House 8--is an environmentally controlled closed brood-grow facility with 3 banks of quad-deck cages in each room. Each room has been assigned a number, each side of each bank has been assigned a row number, and each cage section within each row and level/row has been assigned a replicate number. For statistical analysis, pairs of rows have been designated as blocks. Thus, each block consists of two rows containing 24 replicates (i.e. approximately 3 reps/strain) on all levels resulting in a randomized incomplete block. This allows for a total of 3,744 pullets per room. Only rooms 3 and 4 were used for the 35th NCLP&MT resulting in a total pullet count in House 8 of 7,488. The white and brown-egg strains were randomly assigned to three replicates within each block in the house. Entrant strains were assigned to the blocks in a restricted randomized manner with the restrictions being that all strains were approximately equally represented in all rows, levels, and rooms. All chicks were brooded in the same cage during the entire 16 wk rearing period. Paper was placed on the cage floor for the first 7 days within each of the replicate series within each row. Each cage within the replicate was filled with 13 white-egg or brown-egg (13 per 24" x 26" cage) pullets on the day of hatch for a rearing allowance of 48 in^2 (310 cm^2) in for the white-egg layers. The same number of pullets were grown in each replicate for both white and brown-egg strains. The room dividers were in placed between the rooms for this test. The environmental conditions were maintained the same in each room, so that all birds were essentially reared in a contiguous house. Pullet nutrition and husbandry practices are published in the Pullet Rearing Report (Vol. 35, No. 2).

Layer Housing:

The hens were randomly assigned to the replicate cages with white egg and brown egg strains being inter-mingled throughout the houses. The white egg strains occupied approximately 70% of the house and brown egg strains occupied the other 30%. All strains were assigned to be represented as equally as possible in all rows, and levels.

House 5 is a standard height totally enclosed force ventilated open-sided laying house with a scraper pit manure handling system. It has 2 banks of triple deck cages and two banks with 4 levels of cages. The replicates are equipped with feed hoppers to monitor feed consumption for each individual replicate and the feed is distributed by an automatic feeding system. Again, each side of a bank was designated as a row and each row was divided into 9 8-foot replicates/level. There are a total of 252 replicates in house 5 which, can support 6,048 hens.

Cage density is dictated by the cage size in each replicate that contain cages that were either 30.5 or 40.6 cm wide and 40.6 cm deep. The cages were 30.5 and 40.6 cm cages which allowed for a constant density of 64 in^2 (413 cm^2), at 3 or 4 hens/cage, respectively. The white-egg and brown-egg strains were assigned to the replicates in a restricted randomized manner, with the restrictions being that all strains were approximately equally represented in all rows, levels and cage sizes.

Test Design:

The arrangement for the laying test involved a completely randomized design and the main effects were set up in a factorial arrangement. The main effects were strain, population, and molt treatment. Following are general descriptions of the main effects:

Strain

The samples of fertile eggs were provided directly by the breeders involved. All eggs were set and hatched concurrently. A total of seven white egg strains and three brown egg strains participated in the test. See the 35th Hatch Report (Vol. 35, No. 1) for details.

Density

All individual cages within each block contained either the brown and the white egg layers. Thus the replicate blocks contained 24 hens per replicate, for the block with 30.5 x 40.6 cm cages for 8 cages with 3 hens/cage or for the 40.6 x 40.6 cm cages for 6 cages with 4 hens/cage. Cage densities were held constant at 413 cm^2 (64 in^2) for two cage dimensions to as closely represent the commercial animal welfare guidelines as possible. The initial population sizes provided for a constant density and feeder space allocation. Therefore density and feeder space were not a factors in this test.

Layer Management (Molting):

The molt experiment was conducted utilizing all hens involved in the layer test. Participating strains were randomly divided into three groups such that all strains, populations, and levels were approximately equally represented. Induced molts can be started at almost any age of production, but generally, laying and breeding hens are started into the molt somewhere between 55 to 70 weeks of age. In this test each group received one of the following treatments during the molt period commencing at 66 wks of age. The weeks in the molt tables were, therefore, adjusted accordingly, depending on the exact week in which the induced molt procedure was started.

Sample replicates from all strains or treatment groups were randomly selected. These replicates were monitored as follows as representative of the hens in all like strain treatment combinations. When the weight loss target was reached for the treatment group or strain, all replicates of that strain or group were returned to feed based on their sampled sister replicates weight loss.

The lighting schedule is set in accordance with the treatment groups. The light program for the non-molted control group never changed. The lighting for both molt treatments was adjusted for actual conditions and to match the requirements of both the molting program and the subsequent desired stimulation.

The house temperature was maintained as close to 80± 5° F. The hens were monitored daily for high and low temperatures throughout the test.

Full Fed Control: The replicates assigned to the full fed control group were maintained according to the standard management program as outlined previously. The laying house was partitioned such that the lighting program was consistent for maximum egg production. These hens were maintained throughout the laying period with no pause in egg production.

Feed Restriction: The following regimen was followed for this molting program which provided for a maximum of a 14 day fast.

Day -7 Day length was increased to 24 hr at 65 weeks of age for the entire flock.
Day -7 A sample of birds was weighed to determine the premolt weight. Target weight (30% body weight loss) was calculated using the premolt weight.
Day 0 All remaining feed was removed from the feeders and the light period was reduced to 9 hours. All moribund birds were removed before feed restriction.
Day +1 A booster vaccination for Newcastle/Bronchitis was provided.
Day +7 to 9 A sample of birds was weighed at 7 and 9 days after feed removal to determine daily body weight loss. The weight loss per day was used to calculate the days to reach the target weight of a 30% weight loss.
Day +13 to 14 Birds were weighed based on the target weight loss to determine actual body weight loss. Strains and/or treatment groups were put back on full feed of the Molt Diet.
Day +24 Day light hours were increased to 12 hours.
Day +28 All selected replicates were weighed. Birds which had been on a molt program were returned to layer diet E. Day length was increased to 14 hours.
Day +31 Lights were returned to 16.5 hours of day light

Non-anorexic molt program: The hens were fed the Molt Diet that was low protein and energy, and that was balanced for the vitamins and minerals required for body maintenance. This diet has been shown to maintain an an-ovulatory state during the latter stages of the molt period. The management and light program was consistent with the other molting programs.

Day -7 The light period was increased to 24 hours.
Day -7 A sample of birds was weighed to determine the premolt weight. Target weight (24% body weight loss) was calculated using the premolt weight.
Day 0 All remaining laying feed was removed from the feeders and replaced with a low protein/energy maintenance diet, and the light period was reduced to 9 hours. The low protein/energy maintenance diet was provided on an *ad libitum* basis.
Day +1 A booster vaccination for Newcastle/Bronchitis was provided.
Day +7 to 9 A sample of birds was weighed 7 and 9 days after the feed change to determine body weight loss. Weight loss per day was calculated using body weights and target weight for 24% weight loss was determined.
Day +13 All birds in all selected replicates were weighed to determine body weight loss.
Day +24 The light period was increased to 12 hours.
Day +28 All selected replicates were weighed. Birds which had been the molt program were returned to layer diet E. Day length was increased to 14 hours.
Day +31 Lights were returned to 16.5 hours of day light

Layer Nutrition:

Layer diets are identified as Diets D, E, F, G, H, I, M, N, O, P, and Q which consist of a pre-lay diet and a series of layer diets formulated to assure a daily protein, mineral and amino acid intake as shown below.

The diets are provided to the birds in a crumblized form to reduce feed wastage. Dietary formulations are presented in the following section. Feed was offered ad libitum in accordance with the guidelines that all birds should receive acceptable nutrient intake at all times depending on the bird's age and production rate (see Table). The diet fed at any given time provides the nutrient intake and is determined based upon flock production stage, and average daily feed intake.

During period 3 there was a rapid onset of Osteo malacia in the flock. The diagnosis was confirmed 2 days after it was observed in the flock. The manifestation was a sudden increase in mortality with a concurrent depression in production. The immediate treatment was water treatment with a vitamin supplement containing Vit D3 and administration of Calcium to the hens in the form of Oyster shell. This resulted in an immediate reduction in mortality to pre onset levels.

This was believed to be a result of using a finely ground limestone in the crumblized feed used to enhance the feed flow in the automated system. The for of limestone used was not retained in the gut during periods of need, when the shell is being laid down in the uterus. Therefore, for the remainder of the test 2% of the supplemental calcium was provided to the hens in the form of large particle limestone which was added at the farm.

The diet provided during the molt, consisted of a low protein/energy diet. These are described in the tables which follow. The molt diet was formulated to provide the layer with the nutrients needed to maintain a static body weight with no egg production.

MINIMUM DAILY INTAKE OF NUTRIENTS PER BIRD AT VARIOUS STAGES OF PRODUCTION

Production Stage	> 87% and Pre-Peak	87-80%	80-70%	<70%
White-Egg Layers				
Protein (g/day)	19	18	17	16
Calcium (g/day)	3.8	3.8	4.0	4.0
Lysine (mg/day)	820	780	730	690
TSAA (mg/day)	700	670	630	590
Brown Egg Layers				
Protein (g/day)	20	19	18	17
Calcium (g/day)	3.8	3.8	3.8	4.0
Lysine (mg/day)	830	820	780	730
TSAA (mg/day)	710	700	670	630

LAYING HOUSE FEEDING PROGRAM

Rate of Production	Consumption Per 100 Birds/Day (kg)	Diet Fed: White Egg Strains	Diet Fed: Brown Egg Strains
Weeks 17-26	< 9.52	D	D
Pre-Peak and > 87%	< 9.52	F	E
	9.57-10.39	G	F
	10.43-11.29	I	H
	11.34-12.20	N	M
	12.25-13.11	P	O
	>13.15	Q	Q
80-87%	< 9.52	G	F
	9.57-10.39	H	G
	10.43-11.29	M	I
	11.34-12.20	O	N
	12.25-13.11	Q	P
	>13.15	Q	Q
70-80%	< 9.52	H	G
	9.57-10.39	I	H
	10.43-11.29	N	M
	11.34-12.20	P	O
	12.25-13.11	Q	Q
	>13.15	Q	Q
< 70%	< 9.52	I	H
	9.57-10.39	M	I
	10.43-11.29	O	N
	11.34-12.20	Q	O
	12.25-13.11	Q	Q
	>13.15	Q	Q
Post-Molt < 70%	< 9.52	G	F
	9.57-10.39	H	G
	10.43-11.29	M	I
	11.34-12.20	O	N
	12.25-13.11	Q	P
	>13.15	Q	Q

LAYING PERIOD DIETS

	Diet Identification[1]				
	----------Layer Diets----------				
Ingredient	D	E	F	G	H
	----------Pounds Per Ton----------				
Corn	952.30	985.50	1067.90	1097.10	1153.50
Corn Gluten Meal	100.00	100.00	128.00	82.00	24.00
Soybean Meal 48%	618.00	592.00	500.00	512.00	525.00
Calcium Carb	188.00	188.00	188.00	188.00	180.00
Phosphate Mono/D	29.50	30.00	30.00	30.00	30.00
Sodium Bi-Carb	3.00	2.50	2.50	3.00	3.00
Salt	6.00	6.00	6.00	6.00	6.50
Methionine	2.50	2.60	2.80	3.70	4.00
Choline Chloride	7.70	6.40	6.80	5.20	4.00
Vitamin premix	1.00	1.00	1.00	1.00	1.00
Min. premix	1.00	1.00	1.00	1.00	1.00
T - Premix	1.00	1.00	2.00	2.00	2.00
Fat	88.00	82.00	63.00	68.00	64.00
MYC-OUT 65	1.00	1.00	1.00	1.00	2.00
.06 Sel Premix	1.00	1.00	1.00	1.00	1.00
Total	2000	2000	2000	2000	2000
Calculated Analysis					
Protein %	21.49	21.03	20.00	18.99	17.75
ME kcal/kg	2925	2925	2925	2925	2925
Calcium %	4.00	4.00	3.99	3.99	3.84
T. Phos %	0.63	0.63	0.62	0.61	0.61
Lysine %	1.16	1.06	0.94	0.94	0.94
TSAA %	0.89	0.84	0.84	0.83	0.79

LAYING PERIOD DIETS

Diet Identification[1]

	Layer Diets					
Ingredient	I	M	N	O	P	Q
	Pounds Per Ton					
Corn	1214.80	1285.50	1353.50	1407.10	1420.50	1427.70
Corn Gluten Meal	5.00					
Soybean Meal 48%	500.00	451.00	398.00	360.00	286.00	226.00
Wheat Midds			5.00		63.00	117.00
Calcium Carb	184.00	180.00	182.50	184.00	185.00	186.50
Phosphate Mono/D	23.00	26.00	22.50	21.00	18.50	16.50
Sodium Bi-Carb	3.00	3.00	3.00	3.00	4.00	4.00
Salt	6.00	6.00	6.00	6.00	5.00	5.00
Methionine	3.20	2.75	2.50	2.20	2.00	1.30
Lysine		0.75	0.50	0.20		
Choline Chloride	3.00	2.00	0.50	0.50		
Vit. premix	1.00	1.00	1.00	1.00	1.00	1.00
Min. premix	1.00	1.00	1.00	1.00	1.00	1.00
T - Premix	1.00	1.00	1.00	1.00	1.00	1.00
Fat	52.00	37.00	20.00	10.00	10.00	10.00
MYC-OUT 65	2.00	2.00	2.00	2.00	2.00	2.00
.06% Sel Premix	1.00	1.00	1.00	1.00	1.00	1.00
Total	2000	2000	2000	2000	2000	2000
Calculated Analysis						
Protein %	16.79	15.75	14.75	13.99	12.75	11.75
Me kcal/kg	2925	2925	2925	2882	2875	2859
Calcium %	3.85	3.79	3.80	3.81	3.80	3.80
T. Phos %	0.53	0.55	0.51	0.48	0.46	0.44
Lysine %	0.90	0.86	0.78	0.72	0.62	0.55
TSAA %	0.71	0.66	0.62	0.59	0.55	0.49

MOLT PERIOD DIET

Ingredient	Diet Identification[1] ----------Molt Diet---------- Low Protein/Energy Diet
	----------Pounds Per Ton----------
Corn	694.94
Soybean Hulls	1158.08
Soybean Meal	
Wheat Midds	34.84
Calcium Carb	25.68
Phosphate Mono/D	53.04
Sodium Bi-Carb	
Salt	9.15
Methionine	2.67
Lysine	
Choline Cl 60%	1.00
Vet premix	1.00
Min. premix	1.00
Fat	9.99
Mold Inhibitor	1.00
.06% Sel Premix	1.00
Iron Sulfate	
Manganese Sulfate	
EXT/EXP Soy	
Total	2000
Calculated Analysis	
Protein %	9.8
Me kcal/kg	1650
Calcium %	1.33
T. Phos %	0.70
Lysine %	0.42
TSAA %	0.35

Data Collection Schedule and Procedures:

Egg Production--All eggs that had the potential of being marketed were credited toward the test unit's (replicate) egg production, regardless of the shell condition at the time of collection. All eggs were collected and recorded daily. Egg production was summarized at twenty-eight day intervals, and was calculated and reported on a hen-day basis.

Egg Weight--At twenty-eight day intervals, all eggs produced in the previous 24-hour period were weighed and sorted by size (See egg size distribution). Percentages of eggs within each size category, average egg weight (g), and egg mass (g) were calculated and reported.

Egg Quality--At twenty-eight day intervals, all eggs produced within the previous 24 hours were examined by candling light and graded according to current USDA standards for egg quality. Eggs were graded in the pilot processing facility and handled as they would be in a commercial off-line facility.

Egg Price--Egg income was calculated using three-year regional average prices for farm value of eggs based on egg production and quality evaluation.

Feed Consumption--All feed offered for consumption was recorded for each replicate. At twenty-eight day intervals, feed not consumed was weighed back and feed consumption was calculated. Daily feed intake (kg/100 hens/day) was calculated and reported for each strain. Feed costs were based on the actual feed prices for each feed delivery which were calculated and summarized for the complete production cycle.

Mortality--All mortalities were recorded daily, and obvious accidents were not included in reported mortalities.

Statistical Analyses and Separation of Means:

Analyses of variance were performed on all data. Separate analyses were conducted for white and brown egg strains. Significant differences ($P < 0.01$) within white and brown egg strains are noted by differing letters among columns of means. The blocking effect for the layer house was not significant, therefore, data for houses 4 and 5 were pooled in this analysis. All data were subjected to ANOVA utilizing the GLM procedure of SAS, with main effects of strain and density. First and second order interactions were tested for significance. Mean differences were separated via the PDIFF option of the GLM procedure.

DESCRIPTION OF DATA TABLE STATISTICS

Characterizations of the flock mortality by strain are shown in Tables 1 to 4. First cycle performance of white and brown egg strains are shown on Tables 5 to 10. The molt period performance and weight loss data of the white and brown egg strains are shown on Tables 10 to 18.

Breeder (Strain):

Short identification codes of the breeder and strain of the stock were developed. See more complete information following data tables.

Population and Density Allocations:

White and Brown Hens per Cage	Cage Size Width Depth	Floor Space per Bird	Feeder Space per Bird	Water Nipples per Cage

3	30.5 cm x 40.7 cm	413 cm^2 (64 in^2)	10.2 cm 4.0 in	1
4	40.7 cm x 40.7 cm	413 cm^2 (64 in^2)	10.2 cm 4.0 in	1

Hen Housed Eggs per Bird:

The total number of eggs produced divided by the number of birds housed at 119 days.

Hen Day Egg Production:

The average daily number of eggs produced per 100 hens per day.

Egg Mass:

The average daily production of egg mass in grams per hen day.

Mortality:

The percentage of birds which died between 119 and 462 days of age. Mortality which occurred during the molt period are reported separately

Feed Consumption:

The kilograms of feed consumed daily per 100 hens (housed or hen days).

Feed Conversion:

The grams of egg produced per gram of feed consumed.

Egg Weight:

The average egg weight (gms) for each period sampled. Weight of all eggs collected from previous 24 hours divided by the number of eggs collected.

Egg Income:

The calculated income per hen housed at 119 days, from egg production using three-year regional average egg prices 2001 to 2003 as follows:

Grade	Size	Cents/Dozen
A	Extra Large	84.5
A	Large	82.0
A	Medium	67.2
A	Small	50.4
A	Pee Wee	25.2
B	All	25.2
Checks	All	43.5

Feed Cost:

The calculated feed cost per hen housed at 119 days, using the pounds/diet consumed and the average price of each diet per ton.

Diets	Price Per Ton
D	203.30
E	233.10
F	219.80
G	224.00
H	218.80
Molt Diet LP/LE	161.80

Grade Information:

The average grade of all eggs sampled according to USDA grading standards over all sampling periods. Grades are established by personnel trained in USDA grading standards.

Egg Size Distribution:

Following are the size classifications used for establishing the USDA egg size grading. There has been blending of egg size in this test with the weight cutoff between medium and large being 23.5. This maximizes the number of USDA large eggs just as would occur in a commercial plant. The proportion of the eggs falling into the following size categories are reported in the tables.

Size Category	Ounces/Dozen
Pee Wee	< 18
Small	18 – 21
Medium	21 - 23.5
Large	23.5 – 27
Extra Large	> 27

Metric Conversions:

1 lb = 453.6 g
1 lb = .4536 kg

1 g = .03527 oz
1 kg = 2.204 lb

1 oz = 28.35 g

1 g = 1000 mg
1 kg = 1000 g

TABLE 1. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 35th NCLP&MT (119-462 DAYS)

Breeder (Strain)	Population[1]	Feed Cons (kg/100 hens/d)	Feed Conver-sion (g egg/ g feed)	Eggs Per Bird Housed	Egg Produc-tion (HD%)	Egg Mass (g/HD)	Mortality (%)	Age at 50% Pro-duction (Days)
Dekalb	3	9.8^{def}	0.50^{ab}	262.6	83.8	49.3	15.8	138
White	4	10.3^{abc}	0.50^{ab}	269.6	86.1	51.5	16.3	138
	Average	10.1	0.50	266.1^{C}	85.0^{BC}	50.4^{BC}	16.0^{A}	138^{A}
Hy-Line	3	9.3^{g}	0.49^{ab}	271.9	80.6	46.3	1.7	139
W-36	4	9.4^{fg}	0.49^{ab}	276.0	81.9	47.0	2.9	137
	Average	9.4	0.49	274.0^{BC}	81.2^{E}	46.7^{E}	2.3^{D}	138^{A}
Hy-Line	3	10.6^{ab}	0.49^{ab}	273.1	83.8	51.4	8.4	129
W-98	4	10.2^{bcd}	0.50^{ab}	274.4	83.7	51.2	6.9	130
	Average	10.4	0.49	273.8^{BC}	83.7^{CD}	51.3^{AB}	7.7^{C}	130^{D}
Hy-Line	3	9.3^{g}	0.51^{a}	272.2	81.9	47.7	5.1	137
CV-20	4	9.6^{efg}	0.50^{ab}	274.7	82.8	48.2	4.4	138
	Average	9.4	0.51	273.4^{BC}	82.4^{DE}	48.0^{D}	4.7^{CD}	137^{AB}
Bovans	3	10.0^{cde}	0.50^{ab}	286.4	86.4	50.5	5.8	135
White Exp	4	10.2^{bcd}	0.48^{b}	282.4	85.5	49.5	6.0	135
	Average	10.1	0.49	284.4^{A}	85.9^{B}	50.0^{C}	5.9^{CD}	135^{C}
Bovans	3	10.0^{cd}	0.51^{a}	281.4	88.3	51.3	15.3	135
White	4	10.8^{a}	0.48^{b}	280.1	88.5	52.0	13.3	134
	Average	10.4	0.49	280.8^{AB}	88.4^{A}	51.6^{A}	14.3^{AB}	135^{C}
Lohmann	3	10.1^{cd}	0.50^{ab}	281.4	87.2	51.1	9.6	137
LSL-Lite	4	10.3^{abcd}	0.50^{ab}	288.0	88.6	51.9	9.5	135
	Average	10.2	0.50	284.7^{A}	87.9^{A}	51.5^{AB}	9.5^{BC}	136^{BC}
All Strains	3	9.9	0.50	275.6	84.6	49.7	8.8	136
	4	10.1	0.49	277.9	85.3	50.2	8.5	135
	Average	10.0	0.50	276.9	84.9	49.9	8.6	136

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .
A,B,C,D,E - Different letters denote significant differences (P<.01), comparisons made among strain average values.
a,b,c,d,e,f,g - Different letters denote significant strain*population interactions (P<.01).

TABLE 2. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 35th NCLP&MT (119-462 DAYS)

Breeder (Strain)	Population[1]	Egg Weight (g/egg)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Dekalb	3	58.3	1.2	7.3	22.2	51.8	17.6
White	4	59.3	1.4	5.8	18.6	52.8	21.5
	Average	58.8^{B}	1.3^{BC}	6.5^{C}	20.4^{A}	52.3^{AB}	19.5^{B}
Hy-Line	3	57.2	2.0	10.6	22.8	48.3	16.2
W-36	4	57.1	2 2	11.2	22.4	51.1	13.0
	Average	57.1^{D}	2.1^{A}	10.9^{A}	22.6^{A}	49.7^{B}	14.6^{C}
Hy-Line	3	61.3	0.3	4.7	16.3	44.2	34.4
W-98	4	61.2	0.2	4.9	16.8	42.7	35.3
	Average	61.2^{A}	0.2^{D}	4.8^{D}	16.6^{B}	43.4^{C}	34.8^{A}
Hy-Line	3	58.0	1.5	9.5	22.0	47.7	19.1
CV-20	4	57.9	2.0	7.8	21.1	50.8	18.1
	Average	57.9^{CD}	1.8^{AB}	8.7^{B}	21.6^{A}	49.3^{B}	18.6^{BC}
Bovans	3	58.2	1.0	6. 9	22.4	52.4	17.2
White Exp	4	57.6	1.1	7.8	23.2	52.9	14.9
	Average	57.9^{CD}	1.1^{C}	7.3^{BC}	22.8^{A}	52.6^{AB}	16.0^{BC}
Bovans	3	57.8	0.8	7.2	22.8	55.8	13.2
White	4	58.3	0.9	7.2	23.3	49.3	19.1
	Average	58.1^{BC}	0.8^{CD}	7.2^{BC}	23.0^{A}	52.5^{AB}	16.2^{BC}
Lohmann	3	58.1	1.1	7.1	21.0	53.9	16.8
LSL-Lite	4	58.1	1.5	5.9	22.0	53.8	16.7
	Average	58.1^{BC}	1.3^{BC}	6.5^{C}	21.5^{A}	53.8^{A}	16.7^{BC}
All Strains	3	58.4	1.1	7.6	21.4	50.6	19.2
	4	58.5	1.3	7.2	21.1	50.5	19.8
	Average	58.4	1.2	7.4	21.2	50.5	19.5

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .

A,B,C,D - Different letters denote significant differences (P<.01), comparisons made among strain average values.

TABLE 3. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 35th NCLP&MT (119-462 DAYS)

Breeder (Strain)	Population[1]	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income ($/hen)	Feed Costs ($/hen)
Dekalb	3	96.9	1.8	1.1	0.3	14.65	7.16
White	4	97.5	1.1	1.1	0.3	15.31	7.50
	Average	97.2	1.4^{AB}	1.1	0.3	14.98^{C}	7.33^{BC}
Hy-Line	3	97.8	0.8	1.3	0.1	14.92	7.37
W-36	4	97.6	1.1	1.3	0.1	15.08	7.43
	Average	97.7	0.9^{BC}	1.3	0.1	15.00^{C}	7.40^{BC}
Hy-Line	3	97.1	1.3	1.6	0.0	15.80	7.99
W-98	4	97.4	1.3	1.1	0.2	15.85	7.81
	Average	97.2	1.3^{ABC}	1.3	0.1	15.83^{A}	7.90^{A}
Hy-Line	3	97.7	0.6	1.6	0.1	15.09	7.22
CV-20	4	98.4	0.8	0.7	0.1	15.37	7.40
	Average	98.0	0.7^{C}	1.1	0.1	15.23^{BC}	7.31^{C}
Bovans	3	97.0	1.4	1.5	0.1	16.04	7.70
White Exp	4	97.8	1.0	1.1	0.1	15.77	7.83
	Average	97.4	1.2^{ABC}	1.3	0.1	15.90^{A}	7.77^{A}
Bovans	3	96.7	2.2	1.1	0.1	15.66	7.41
White	4	97.4	1.5	1.1	0.1	15.69	7.90
	Average	97.1	1.8^{A}	1.1	0.1	15.67^{AB}	7.66^{AB}
Lohmann	3	97.5	1.2	1.2	0.0	15.84	7.55
LSL-Lite	4	98.0	1.0	0.8	0.1	16.23	7.76
	Average	97.8	1.1^{BC}	1.0	0.1	16.03^{A}	7.65^{AB}
All Strains	3	97.2	1.3	1.4	0.1	15.43	7.48
	4	97.7	1.1	1.0	0.1	15.61	7.66
	Average	97.5	1.2	1.2	0.1	15.52	7.57

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .
A,B,C - Different letters denote significant differences (P<.01), comparisons made among strain average values.

TABLE 4. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 35th NCLP&MT (119-462 DAYS)

Breeder (Strain)	Population[1]	Feed Cons (kg/100 hens/d)	Feed Conver-sion (g egg/ g feed)	Eggs Per Bird Housed	Egg Produc-tion (HD%)	Egg Mass (g/HD)	Mortality (%)	Age at 50% Pro-duction (Days)
Hy-Line	3	10.3	0.50	284.4	85.4	50.9	5.8	132
Brown	4	10.6	0.49	282.1	86.4	51.7	7.5	131
	Average	10.4^{B}	0.49^{A}	283.2	85.9	51.3^{B}	6.6	132
Bovans	3	11.1	0.47	278.2	85.4	52.3	9.7	131
Brown	4	11.3	0.47	275.0	85.8	52.5	11.8	130
	Average	11.2^{A}	0.47^{B}	276.6	85.6	52.4^{AB}	10.8	131
Bovans	3	10.8	0.49	285.4	87.5	53.3	10.2	132
Goldline	4	11.0	0.48	285.3	86.8	53.1	7.3	133
	Average	10.9^{A}	0.49^{A}	285.3	87.2	53.2^{A}	8.8	132
All Strains	3	10.7	0.49	282.6	86.1	52.2	8.6	132
	4	10.9	0.48	280.8	86.3	52.4	8.9	131
	Average	10.8	0.48	281.7	86.2	52.3	8.7	131

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .
A,B - Different letters denote significant differences (P<.01), comparisons made among strain average values.

TABLE 5. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 35th NCLP&MT (119-462 DAYS)

Breeder (Strain)	Population[1]	Egg Weight (g/egg)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Hy-Line	3	59.4	0.2	4.5	21.9	50.2	23.1
Brown	4	59.6	0.4	3.6	20.3	52.3	23.2
	Average	59.5[B]	0.3	4.1	21.1[A]	51.3	23.1[B]
Bovans	3	61.0	0.2	3.2	16.2	49.3	30.6
Brown	4	61.0	0.2	2.5	16.8	48.4	31.9
	Average	61.0[A]	0.2	2.9	16.5[B]	48.8	31.2[A]
Bovans	3	60.6	0.3	4.2	16.8	48.2	29.9
Goldline	4	61.0	0.1	3.1	17.8	47.0	31.9
	Average	60.8[A]	0.2	3.6	17.3[B]	47.6	30.9[A]
All Strains	3	60.4	0.3	4.0	18.3	49.2	27.8
	4	60.5	0.2	3.1	18.3	49.2	29.0
	Average	60.5	0.2	3.5	18.3	49.2	28.4

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .

A,B - Different letters denote significant differences (P<.01), comparisons made among strain average values.

TABLE 6. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 35th NCLP&MT (119-462 DAYS)

Breeder (Strain)	Population[1]	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income ($/hen)	Feed Costs ($/hen)
Hy-Line	3	97.7	1.4	0.9	0.0	16.28	7.88
Brown	4	97.6	1.1	1.1	0.2	16.22	7.94
	Average	97.6	1.2	1.0	0.1	16.25	7.91[B]
Bovans	3	96.8	1.7	1.5	0.0	16.10	8.29
Brown	4	97.1	1.1	1.7	0.0	16.02	8.30
	Average	97.0	1.4	1.6	0.0	16.06	8.30[A]
Bovans	3	96.8	2.2	0.9	0.1	16.37	8.13
Goldline	4	96.9	1.7	1.4	0.0	16.56	8.33
	Average	96.9	1.9	1.1	0.0	16.46	8.23[A]
All Strains	3	97.1	1.7	1.1	0.0	16.25	8.10
	4	97.2	1.3	1.4	0.1	16.27	8.19
	Average	97.2	1.5	1.3	0.0	16.26	8.14

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .

A,B - Different letters denote significant differences (P<.01), comparisons made among strain average values.

TABLE 7. EFFECT OF WHITE EGG STRAIN, POPULATION, AND SYNCHRONIZED MOLT ON HENS IN THE 35th NCLP&MT (462-490 DAYS)

Breeder (Strain)	Population[1]	17 Wk Body Wt (kg)	66 Wk Body Wt (kg)	1st Cycle Wt Gain (%)	Lowest Body Weight (kg)	Molt Weight Loss (%)	70 Wk Body Wt (kg)
Dekalb	3	1.16	1.65	43.9	1.34	18.7	1.40
White	4	1.22	1.70	41.1	1.39	18.7	1.46
	Average	1.19^{D}	1.68^{B}	42.5	1.37^{B}	18.7	1.43
Hy-Line	3	1.29	1.76	38.8	1.41	19.3	1.47
W-36	4	1.26	1.72	37.6	1.42	17.3	1.47
	Average	1.27^{B}	1.74^{B}	38.2	1.42^{B}	18.3	1.47
Hy-Line	3	1.36	1.99	48.1	1.64	17.0	1.67
W-98	4	1.34	1.95	46.9	1.50	22.9	1.54
	Average	1.35^{A}	1.97^{A}	47.5	1.57^{A}	20.0	1.61
Hy-Line	3	1.25	1.69	33.7	1.37	19.0	1.43
CV-20	4	1.25	1.70	39.7	1.35	20.0	1.40
	Average	1.25^{BC}	1.70^{B}	36.7	1.36^{B}	19.5	1.41
Bovans	3	1.29	1.75	35.7	1.47	15.7	1.49
White Exp	4	1.26	1.69	35.0	1.39	17.9	1.44
	Average	1.28^{B}	1.72^{B}	35.3	1.43^{B}	16.8	1.46
Bovans	3	1.22	1.75	41.6	1.39	20.6	1.41
White	4	1.25	1.72	38.2	1.38	19.8	1.43
	Average	1.24^{BCD}	1.74^{B}	39.9	1.38^{B}	20.2	1.42
Lohmann	3	1.22	1.72	41.6	1.40	18.3	1.43
LSL-Lite	4	1.22	1.68	38.6	1.38	17.8	1.39
	Average	1.22^{CD}	1.70^{B}	40.1	1.39^{B}	18.0	1.41
Average	3	1.25	1.76	40.5	1.43	18.4	1.47
	4	1.26	1.74	39.6	1.40	19.2	1.45
	Average	1.26	1.75	40.0	1.42	18.8	1.46

[1]All strains were housed at a constant density of; 413 cm^2 equals 64 in^2 .

A,B,C,D Different letters denote significant differences ($P < .01$), comparisons made among strain average values.

TABLE 8. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON HENS IN THE 35th NCLP&MT (462-490 DAYS)

Breeder (Strain)	Molt Program	17 Wk Body Wt (kg)	66 Wk Body Wt (kg)	1st Cycle Wt Gain (%)	Lowest Body Weight (kg)	Molt Weight Loss (%)	70 Wk Body Wt (kg)
Dekalb	NM	1.23	1.72	41.9	1.64	4.4	1.65
White	NF	1.18	1.66	41.0	1.36	17.8	1.37
	FR	1.16	1.65	44.7	1.09	33.8	1.27
Hy-Line	NM	1.26	1.72	39.0	1.69	1.5	1.70
W-36	NF	1.26	1.75	39.8	1.35	22.6	1.35
	FR	1.30	1.75	35.8	1.21	30.9	1.37
Hy-Line	NM	1.34	1.92	45.8	1.76	7.9	1.75
W-98	NF	1.36	1.98	48.6	1.55	21.5	1.55
	FR	1.35	2.01	48.1	1.40	30.5	1.51
Hy-Line	NM	1.23	1.65	36.8	1.60	2.6	1.60
CV-20	NF	1.27	1.71	35.4	1.30	23.8	1.30
	FR	1.25	1.73	37.9	1.18	32.1	1.34
Bovans	NM	1.28	1.74	36.2	1.76	-1.0	1.70
White Exp	NF	1.26	1.68	33.3	1.35	19.5	1.35
	FR	1.28	1.74	36.4	1.18	32.0	1.34
Bovans	NM	1.23	1.73	41.3	1.66	4.0	1.66
White	NF	1.26	1.74	37.2	1.34	22.8	1.33
	FR	1.23	1.74	41.2	1.15	33.8	1.28
Lohmann	NM	1.19	1.68	42.4	1.65	1.9	1.67
LSL-Lite	NF	1.23	1.71	43.0	1.37	20.0	1.31
	FR	1.24	1.69	35.0	1.15	32.2	1.25
All Strains	NM	1.25	1.74	40.5	1.68^{X}	3.0^{Z}	1.68^{Y}
	NF	1.26	1.75	39.8	1.38^{Y}	21.1^{Y}	1.36^{Z}
	FR	1.26	1.76	39.9	1.19^{Z}	32.2^{X}	1.34^{Z}

X,Y,Z - Different letters denote significant differences ($P < .01$), comparisons made among molt program average values.
NM = Non-molted; NF = Non-fasted molt; FR = 13-day fast.

TABLE 9. EFFECT OF BROWN EGG STRAIN, POPULATION, AND SYNCHRONIZED MOLT ON HENS IN THE 35th NCLP&MT (462-490 DAYS)

Breeder (Strain)	Population[1]	17 Wk Body Wt (kg)	66 Wk Body Wt (kg)	1st Cycle Wt Gain (%)	Lowest Body Weight (kg)	Molt Weight Loss (%)	70 Wk Body Wt (kg)
Hy-Line	3	1.48	2.07	40.7	1.73	16.3	1.80
Brown	4	1.43	2.10	46.3	1.76	15.4	1.84
	Average	1.46[B]	2.08	43.5	1.75	15.9	1.82
Bovans	3	1.56	2.02	31.0	1.72	14.9	1.83
Brown	4	1.56	2.04	32.2	1.70	16.8	1.79
	Average	1.56[A]	2.03	31.6	1.71	15.9	1.81
Bovans	3	1.48	2.06	42.8	1.70	17.5	1.78
Goldline	4	1.52	2.04	36.4	1.69	17.2	1.76
	Average	1.50[AB]	2.05	39.6	1.69	17.4	1.77
All Strains	3	1.50	2.05	38.2	1.72	16.3	1.80
	4	1.50	2.06	38.3	1.72	16.5	1.79
	Average	1.50	2.06	38.2	1.72	16.4	1.80

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .
A,B - Different letters denote significant differences ($P < .01$), comparisons made among strain average values.

TABLE 10. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON HENS IN THE 35th NCLP&MT (462-490 DAYS)

Breeder (Strain)	Molt Program	17 Wk Body Wt (kg)	66 Wk Body Wt (kg)	1st Cycle Wt Gain (%)	Lowest Body Weight (kg)	Molt Weight Loss (%)	70 Wk Body Wt (kg)
Hy-Line	NM	1.41	2.07	47.8	1.99	3.8	1.99
Brown	NF	1.49	2.02	37.4	1.70	15.9	1.71
	FR	1.47	2.16	45.3	1.56	27.9	1.75
Bovans	NM	1.53	2.08	36.0	1.97	5.3	1.97
Brown	NF	1.55	2.07	34.8	1.72	16.7	1.77
	FR	1.59	1.95	24.0	1.43	25.6	1.69
Bovans	NM	1.53	2.05	38.3	2.00	2.4	2.02
Goldline	NF	1.47	2.03	40.1	1.63	19.5	1.63
	FR	1.51	2.08	40.3	1.45	30.3	1.66
All Strains	NM	1.49	2.07	40.7	1.99^{X}	3.8^{Z}	1.99^{Y}
	NF	1.50	2.04	37.4	1.68^{Y}	17.4^{Y}	1.70^{Z}
	FR	1.52	2.06	36.6	1.48^{Z}	27.9^{X}	1.70^{Z}

X,Y,Z - Different letters denote significant differences ($P < .01$), comparisons made among molt program average values.
NM = Non-molted; NF = Non-fasted molt; FR = 13-day fast.

TABLE 11. EFFECT OF WHITE EGG STRAIN AND MOLT ON PERFORMANCE OF HENS IN THE 35th NCLP&MT DURING THE MOLT PERIOD (462-490 DAYS)*

Breeder (Strain)	Population[1]	Feed Cons (kg/100 hens/d)	Eggs Per Bird Housed	Egg Production (HD%)	Mortality (%)	Egg Income ($/hen)	Feed Costs ($/hen)
Dekalb	3	7.7	8.2	37.3	4.4	0.48	0.30
White	4	7.4	8.1	37.1	5.6	0.47	0.29
	Average	7.5^{AB}	8.1	37.2	5.0^{A}	0.47	0.29^{B}
Hy-Line	3	6.8	8.7	32.2	0.8	0.54	0.35
W-36	4	7.3	9.5	35.5	0.9	0.57	0.36
	Average	7.1^{BC}	9.1	33.8	0.9^{B}	0.56	0.36^{A}
Hy-Line	3	7.9	9.0	35.9	2.1	0.55	0.36
W-98	4	7.6	9.0	35.2	1.5	0.54	0.37
	Average	7.7^{AB}	9.0	35.5	1.8^{B}	0.55	0.37^{A}
Hy-Line	3	6.8	9.4	35.1	1.3	0.56	0.33
CV-20	4	6.8	9.2	35.2	0.2	0.56	0.33
	Average	6.8^{C}	9.3	35.1	0.8^{B}	0.56	0.33^{AB}
Bovans	3	7.4	9.6	37.0	0.9	0.58	0.36
White Exp	4	7.7	9.2	35.1	0.7	0.55	0.38
	Average	7.6^{AB}	9.4	36.1	0.8^{B}	0.57	0.37^{A}
Bovans	3	7.6	9.1	40.0	3.4	0.54	0.30
White	4	8.3	8.9	37.7	4.7	0.52	0.35
	Average	7.9^{A}	9.0	38.9	4.1^{A}	0.53	0.33^{AB}
Lohmann	3	7.5	10.0	39.0	0.8	0.61	0.34
LSL-Lite	4	7.7	9.3	37.6	3.4	0.55	0.34
	Average	7.6^{AB}	9.6	38.3	2.1^{B}	0.58	0.34^{A}
Average	3	7.4	9.1	36.6	1.9	0.55	0.34
	4	7.5	9.0	36.2	2.4	0.54	0.35
	Average	7.5	9.1	36.4	2.2	0.54	0.34

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .
A,B,C - Different letters denote significant differences (P<.01), comparisons made among strain average values.
*There was insufficient egg size and quality data for the molt period. This information will be included in the second cycle tables.

TABLE 12. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 35th NCLP&MT DURING THE MOLT PERIOD (462-490 DAYS)*

Breeder (Strain)	Molt Program	Feed Cons (kg/100 hens/d)	Eggs Per Bird Housed	Egg Production (HD%)	Mortality (%)	Egg Income ($/hen)	Feed Costs ($/Hen)
Dekalb	NM	10.9	17.6^{c}	80.9^{ab}	2.4	1.01^{c}	0.52
White	NF	7.2	3.8^{de}	16.9^{ef}	6.0	0.23^{de}	0.24
	FR	4.5	3.0^{e}	13.9^{efgh}	6.5	0.18^{e}	0.12
Hy-Line	NM	10.0	19.4^{b}	72.4^{d}	0.9	1.18^{b}	0.60
W-36	NF	6.9	4.5^{de}	16.6^{efg}	0.9	0.28^{de}	0.30
	FR	4.3	3.5^{de}	12.5^{gh}	0.8	0.21^{de}	0.17
Hy-Line	NM	10.9	19.2^{bc}	75.7^{cd}	1.4	1.16^{b}	0.64
W-98	NF	8.2	4.6^{d}	17.9^{e}	1.6	0.28^{d}	0.33
	FR	4.2	3.2^{de}	13.1^{fgh}	2.4	0.20^{de}	0.13
Hy-Line	NM	10.3	20.2^{ab}	76.7^{bcd}	1.1	1.22^{ab}	0.61
CV-20	NF	6.2	4.6^{de}	16.9^{ef}	0.8	0.28^{de}	0.25
	FR	3.8	3.1^{e}	11.8^{h}	0.4	0.19^{e}	0.14
Bovans	NM	10.7	20.4^{ab}	78.2^{bc}	0.5	1.23^{ab}	0.63
White Exp	NF	8.0	4.6^{d}	17.6^{e}	0.5	0.28^{d}	0.33
	FR	4.1	3.2^{de}	12.4^{gh}	1.4	0.20^{de}	0.15
Bovans	NM	10.8	19.9^{b}	85.3^{a}	3.0	1.17^{b}	0.57
White	NF	7.6	3.9^{de}	18.1^{e}	5.0	0.24^{de}	0.23
	FR	5.5	3.1^{e}	13.2^{fgh}	4.2	0.19^{e}	0.17
Lohmann	NM	10.9	21.7^{a}	85.4^{a}	2.4	1.31^{a}	0.62
LSL-Lite	NF	7.7	4.1^{de}	17.1^{ef}	2.8	0.25^{de}	0.27
	FR	4.4	3.0^{e}	12.4^{gh}	1.0	0.18^{e}	0.14
Average	NM	10.6^{X}	19.8	79.2	1.7	1.18	0.60^{X}
	NF	7.4^{Y}	4.3	17.3	2.5	0.26	0.28^{Y}
	FR	4.4^{Z}	3.2	12.8	2.4	0.19	0.15^{Z}

X,Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.
a,b,c,d,e,f,g,h - Different letters denote significant strain*population interactions (P<.01).
NM = Non-molted; NF = Non-fasted molt; FR = 13-day fast.
*There was insufficient egg size and quality data for the molt period. This information will be included in the second cycle tables.

TABLE 13. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 35th NCLP&MT DURING THE MOLT PERIOD (462-490 DAYS)*

Breeder (Strain)	Population[1]	Feed Cons (kg/100 hens/d)	Eggs Per Bird Housed	Egg Production (HD%)	Mortality (%)	Egg Income ($/hen)	Feed Costs ($/Hen)
Hy-Line	3	7.5	9.7	37.3	1.0	0.58	0.36
Brown	4	8.2	10.3	39.4	1.4	0.60	0.39
	Average	7.8^{B}	10.0^{A}	38.4	1.2	0.59	0.37
Bovans	3	8.2	8.7	35.4	3.7	0.54	0.37
Brown	4	8.8	8.6	36.9	2.2	0.53	0.39
	Average	8.5^{A}	8.6^{B}	36.1	2.9	0.53	0.38
Bovans	3	8.4	9.8	39.4	2.2	0.59	0.39
Goldline	4	8.8	9.6	36.7	3.1	0.58	0.43
	Average	8.6^{A}	9.7^{A}	38.1	2.6	0.58	0.41
All Strains	3	8.0^{Z}	9.4	37.4	2.3	0.57	0.37
	4	8.6^{Y}	9.5	37.7	2.2	0.57	0.40
	Average	8.3	9.4	37.5	2.2	0.57	0.39

[1]All strains were housed at a constant density of: 413 cm^2 equals 64 in^2 .
A,B - Different letters denote significant differences (P<.01), comparisons made among strain average values.
Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.
*There was insufficient egg size and quality data for the molt period. This information will be included in the second cycle tables.

TABLE 14. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 35th NCLP&MT DURING THE MOLT PERIOD (462-490 DAYS)*

Breeder (Strain)	Molt Program	Feed Cons (kg/100 hens/d)	Eggs Per Bird Housed	Egg Produc-tion (HD%)	Mortality (%)	Egg Income ($/hen)	Feed Costs ($/Hen)
Hy-Line	NM	10.5	20.8	79.0	0.7	1.22	0.62
Brown	NF	8.2	5.9	23.8	1.5	0.37	0.31
	FR	4.8	3.2	12.3	1.4	0.19	0.18
Bovans	NM	11.5	17.6	73.8	0.9	1.08	0.61
Brown	NF	8.9	5.6	22.9	4.3	0.34	0.36
	FR	5.3	2.8	11.7	3.6	0.17	0.18
Bovans	NM	11.4	20.4	78.5	1.1	1.23	0.69
Goldline	NF	9.2	5.9	23.9	3.8	0.36	0.37
	FR	5.2	2.8	11.9	2.9	0.17	0.17
All Strains	NM	11.1^{X}	19.6^{X}	77.1^{X}	0.9^{Z}	1.18^{X}	0.64^{X}
	NF	8.8^{Y}	5.8^{Y}	23.5^{Y}	3.2^{Y}	0.36^{Y}	0.35^{Y}
	FR	5.1^{Z}	3.0^{Z}	12.0^{Z}	2.6^{YZ}	0.18^{Z}	0.18^{Z}

X,Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.
NM = Non-molted; NF = Non-fasted molt; FR = 13-day fast.
*There was insufficient egg size and quality data for the molt period. This information will be included in the second cycle tables.

Entries 35th NCLP&MT

Stock Suppliers and Categories

Breeder	Stock	Category[1]	Source
Hy-Line International P.O. Box 310 Dallas Center, IA 50063	W-36	I-A	Hy-Line International 4432 Highway 213, Box 309 Mansfield, GA 30255
	W-98	I-A	(Same)
	CV-20	I-A	(Same)
	Hy-Line Brown	I-A	(Same)
Lohmann Tierzucht Inc., N.A. 2433 Bethany Rd Sycamore, IL 60178	Lohmann LSL-Lite	I-A	Brickland Enterprises Inc. P.O. Box 626 Blackstone, VA 2382
Centurion Poultry 1471 Lane Creek Road Bogart, GA 30622	Bovans White	I-A	Centurion Poultry Inc. P.O. Box 591 86 O'Neal Road Lexington, GA 3064822
	Bovans White Experimental	III-A	(Same)
	Bovans Brown	I-A	(Same)
	Bovans Goldline	I-A	(Same)
Centurion Poultry 1471 Lane Creek Road Bogart, GA 30622	Dekalb White	I-A	Centurion Poultry Inc. P.O. Box 591 86 O'Neal Road Lexington, GA 3064822

[1] I = Extensive distribution in southeast United States
II = Little or no distribution in southeast United States
III = Unavailable for commercial distribution in United States
A = Entry requested
C = Entry not requested